

SANYO Service Manual

MODEL: FVM4012
CHASSIS NO: P40142-01



Made by:

Approved by:

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Attachment 1: FVM4012 exploded diagram

Attachment 2: 40-RSC803-MAD2HG SCH

Attachment 3: 40-E371C4-PWG1XG SCH

Attachment 4: 40-E5300A-KEA2XG SCH

Attachment 5: 40-C8E530-IRA2LG SCH

Attachment 6: 40-RT4311-DRA2XG SCH

Attachment 7: 40-RSC803-MAD2HG PCB Layout

Attachment 8: 40-E371C4-PWG1XG PCB Layout

Attachment 9: 40-E5300A-KEA2XG PCB Layout

Attachment 10: 40-C8E530-IRA2LG PCB Layout

Attachment 11: 40-RT4311-DRA2XG PCB Layout

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1. Precautions and Safety Notices

1.1 Important Information

**CAUTION**

RISK OF ELECTRIC SHOCK.
DO NOT OPEN.



This symbol indicates that this product incorporates double insulation between hazardous main voltage and user accessible parts. When servicing, use only identical replacement parts.

Caution: To reduce the risk of electric shock, do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.



This symbol indicates "dangerous voltage" inside the product that presents a risk of electric shock or personal injury.



This symbol indicates important instructions accompanying the product.

WARNING

To reduce the risk of fire or electric shock, do not expose this product to rain or moisture. This product should not be exposed to dripping or splashing. No objects filled with liquids, such as vases, should be placed on the component.

WARNING

The TV is unstable if it is not properly attached to the base or mounted to the wall. Please follow the base or wall mounting instructions provided in the User's Guide to ensure your safety.

WARNING The batteries shall not be exposed to excessive heat such as sunshine, fire or the like.

This symbol indicates that this product contains mercury. Special disposal of this product for environmental reasons may be required under the laws applicable to your jurisdiction. For disposal or recycling information, please contact your local authorities or the Electronic Industries Alliance: www.eiae.org.

Refer to the identification/rating label located on the back panel of your product for its proper operating voltage.

FCC regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.

Cable TV Installer: This reminder is provided to call your attention to Article 820-40 of the National Electrical Code (Section 54 of the Canadian Electrical Code, Part 1) which provides guidelines for proper grounding and, in particular, specifies that the cable ground should be connected to the grounding system of the building as close to the point of cable entry as practical.

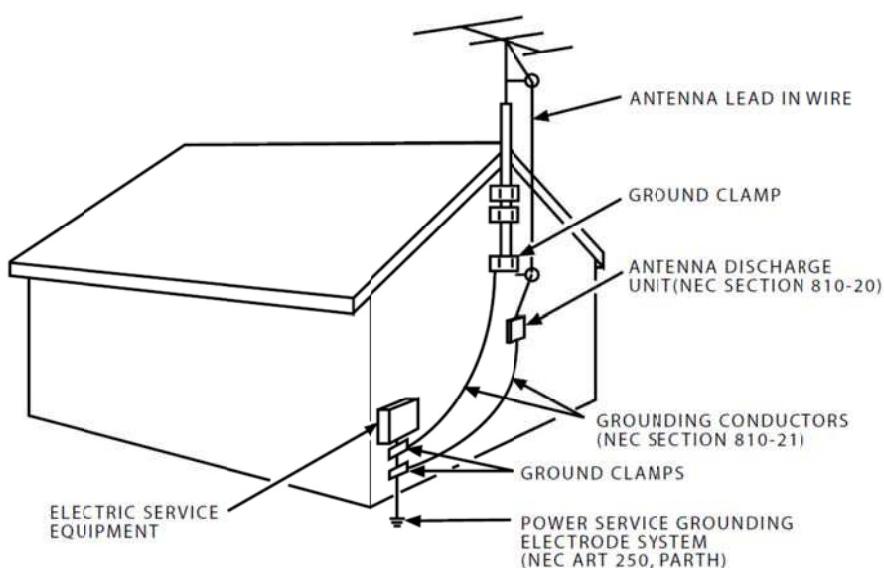
Important: This television is a table model and is designed to sit on a firm, flat surface. Don't place the TV on soft carpeting or similar surface because the ventilation slots on the bottom of the unit will be blocked, resulting in reduced lifetime from overheating. To assure adequate ventilation for this product, maintain a spacing of 4 inches from the top and side of the TV receiver and 2 inches from the rear of the TV receiver and other surfaces.

Also, make sure the stand or base you use is of adequate size and strength to prevent the TV from being accidentally tipped over, pushed off, or pulled off. This could cause personal injury and/or damage to the TV. Refer to the Important Safety Instructions on the next page.

The Power button (followed by the power symbol) on this TV and your remote control puts the TV into a very low-power standby mode but will not completely turn the power off. In order to completely shut the power off, you will need to disconnect the power cord from the outlet. The mains plug/appliance coupler is used as disconnect device, the disconnect device shall remain readily operable. Therefore, you should ensure that the TV is installed in a manner that allows you to disconnect the power cord when desired.

1.2 Important Safety Instructions

1. Read and follow all instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
5. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
6. Protect the power cord from being walked on or pinched particularly at plugs, receptacles, and the point where it exits from the component.
7. Do not use this component near water.
8. Only use the attachments/accessories specified by the manufacturer.
9. Clean only with dry cloth.
10. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the component. When the TV is placed on a cart, use caution when moving the cart to avoid injury from tip-over.
11. Warning: To avoid any injury caused by lean of the product, please always ensure the whole product was place within the table surface in horizontal.
12. Unplug this component during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Service is required when the component is damaged in any way, such as power supply cord or plug damage, liquid spilled on or objects falling onto the component, rain or moisture exposure, abnormal operation, or if the component has been dropped.
14. If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984 (Section 54 of Canadian Electrical Code, Part 1) provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See following example:



2. Product Specification

2.1 GENERAL SPECIFICATIONS

Display Size	40"
Viewable Display size	39.9"
Description	LED FHD TV
Panel Type	Color TFT LCD
Market Intro / Availability	2012/10/20 ETA
Cabinet Design	E5300
Factory	Huizhou, China
PANEL SPECIFICATION	SEC LSC400HM01 Opencell
Backlight	E-LED Opencell
Refresh Rate	60Hz
Resolution	1080p
Contrast Ratio	4000 (typ.)
Display Aspect Ratio	16.9
Display Resolution	1920*1080
Colors:	16.7 Million
Brightness (cd/m ²)	280 nits (typ.)
Bit Depth	8 bit
Viewing Angle Horizontal/Vertical	178 degrees (horizontal/vertical)
Response Time (Gray to Gray)	8ms
VIDEO	
Adjustable Color Temperature	Yes
Adjustable Picture Control (bright, cont, sharp, color, tint)	Yes
Format Control	Yes
Dynamic Backlight	No
Light Sensor	No
Comb Filter	3D Y/C
HD Deinterlacing	Yes
Reverse 3:2 Pull Down (Film Mode)	Yes
AUDIO	
Audio Power (Watts) Front Speakers	8W/CH x 2
Balance, Volume, Mute Control	Yes
Equalizer	Yes
Broadcast Stereo	MTS Stereo
Second Audio Program (SAP)	Yes
Dolby Processing	Yes
Noise Reduction	3D
Premium Sound	Surround
SIGNAL FORMAT CAPABILITY	
RF Tuning Capability	ATSC/NTSC/QAM
Analog Video Formats (NTSC/480i)	Composite, Component, RGB
Video Formats (480p, 720p, 1080i)	Component, RGB , HDMI
Video Formats (1080p)	HDMI
CONNECTIONS — Bottom Inputs/Outputs	
RF Input (ATSC/NTSC)	1
Composite Video Input	1
Audio Input for Composite	1--share with Component
Component Video Input (YCrCb/YPrPb)	1
Audio Input for Component Video	1--share with Composite
VGA Input	1
Audio Input for DVI&VGA	1
Digital Audio Output (SPDIF)	1 - Coaxial
CONNECTIONS — Side Inputs/Outputs	
HDMI Inputs	2*1.3(HDMI1 is compatible DVI)
Headphone Jack Output	1
USB Input	1 - SW Upgrade, JPEG

Control Buttons	Power, CH +/-, Vol +/-, Menu/Input
JPEG Viewing	Yes
Program Guide(EPG)	No
Auto Channel Search	Yes
Multilingual On-Screen-Display	English/Spanish/French
Channel Labelling	Yes
Closed Caption Capability	Yes
Parental control (V-Chip)	USA & Canada
Downloadable Ratings	Yes
Picture Reset	Yes
Picture Memory Presets	Yes
Clock	Yes
Sleep Timer	Yes
PC Compatibility	Yes (via RGB&HDMI)
ENERGY INFORMATION	
Energy Star	No
Energy Guide	\$17.00
Power Consumption	80W
Standby Power	<1W
Certification	ETL, FCC,HDMI, DOLBY
ACCESSORIES (INCLUDED)	
Language (English/Spanish)	English/Spanish
Owner Manual	Yes
Quick Start Guide	Yes
Carton (English/Spanish)	Yes
Power Cord	Separated
Remote Model Number	RC3000N04
PRODUCT & PACKAGE INFORMATION	
Product Size (WxHxD) w/ stand (Inches)	36.4x23.9x9.1
Product Size (WxHxD) w/o stand (Inches)	36.4x21.7x1.7
Product Weight w/ stand (lbs)	32
Product Weight w/o stand (lbs)	26.3
Package Size (WxHxD) (Inches)	50.2x26.2x5.4
Package Weight (lbs)	8.6
Stack Height	6 layers
ISTA Compliance	No
VESA MOUNTING SPECIFICATIONS	
VESA Mounting	Yes
Screw Size	M6X12
Screw Length	12mm
Screw Pitch	4mm
INDUSTRIAL DESIGN	
Finish on Front	Black brush matt. molding
Finish on Back	Texture molding
Finish on Stand	Glass with Black neck
Cabinet Design	E5300
Control Buttons	Molded
Chassis	RSC8L

2.2 Support Timing

Input		Signal Compatability
Antenna/Cable		480i, 480p, 720p, 1080i (NTSC, ATSC, and QAM formats)
Composite Video		480i
Component Video		480i, 480p, 720p/60Hz, 1080i/60Hz
HDMI		480i, 480p, 720p/60Hz, 1080i/60Hz, 1080p/60Hz

Resolution		Aspect Ratio	Horizontal frequency(kHz)	Vertical frequency(kHz)	DotClock frequency(kHz)	Standard
VGA	640*480	4:3	31.47	59.94	25.175	VGA
			37.86	72.81	31.500	VESA
			37.50	75.00	31.500	VESA
			43.27	85.01	36.000	VESA
(DOS)	720*400	18:10	31.47	70.00	28.320	VGA-T
SVGA	800*600	4:3	35.16	56.25	36.000	VESA Guidelines
			37.88	60.32	40.000	VESA Guidelines
			48.08	72.19	50.000	VESA
			46.88	75.00	49.500	VESA
			53.67	85.06	56.250	VESA
XGA	1024*768	4:3	48.36	60.00	65.000	VESA Guidelines
			56.48	70.07	75.000	VESA
			60.02	75.02	78.750	VESA
			68.68	85.00	94.500	VESA
WXGA	1360(6)*768	16:9	47.71	60.00	85.500	CVT

3. Exploded Diagram

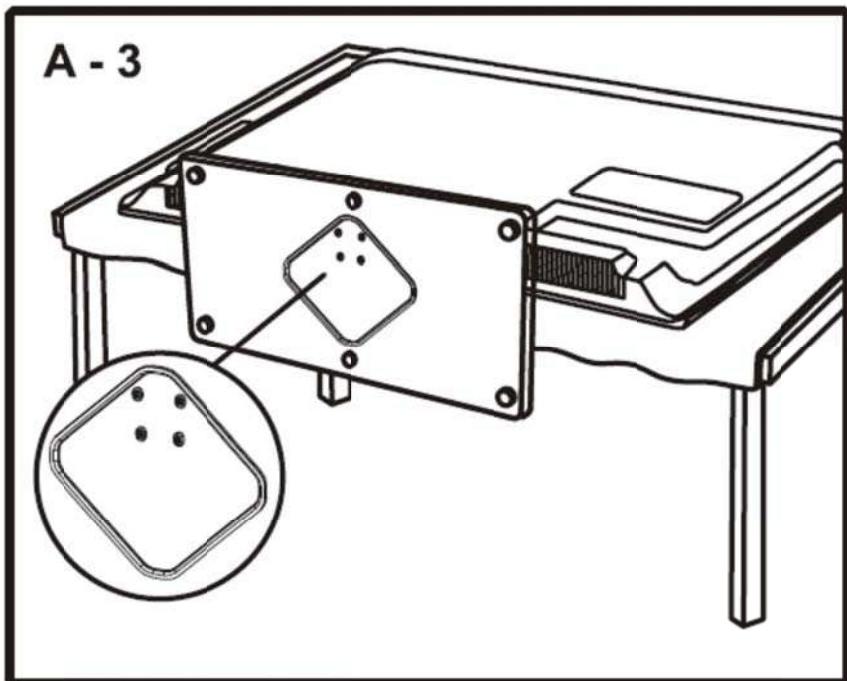
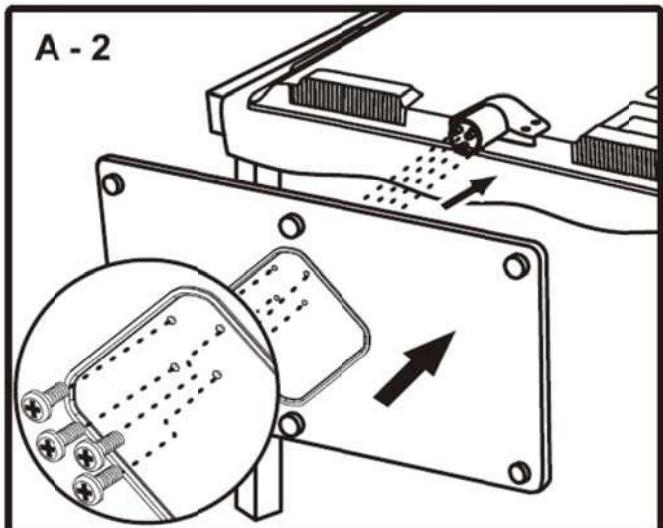
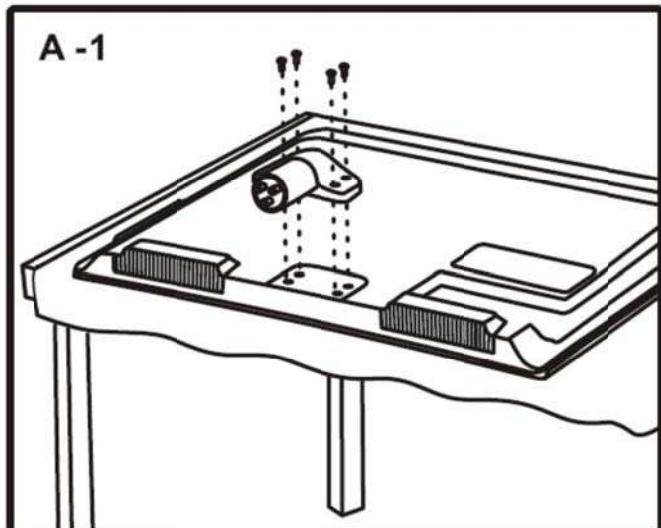
3.1 The TV set exploded drawing

Check the Attachment 1-1

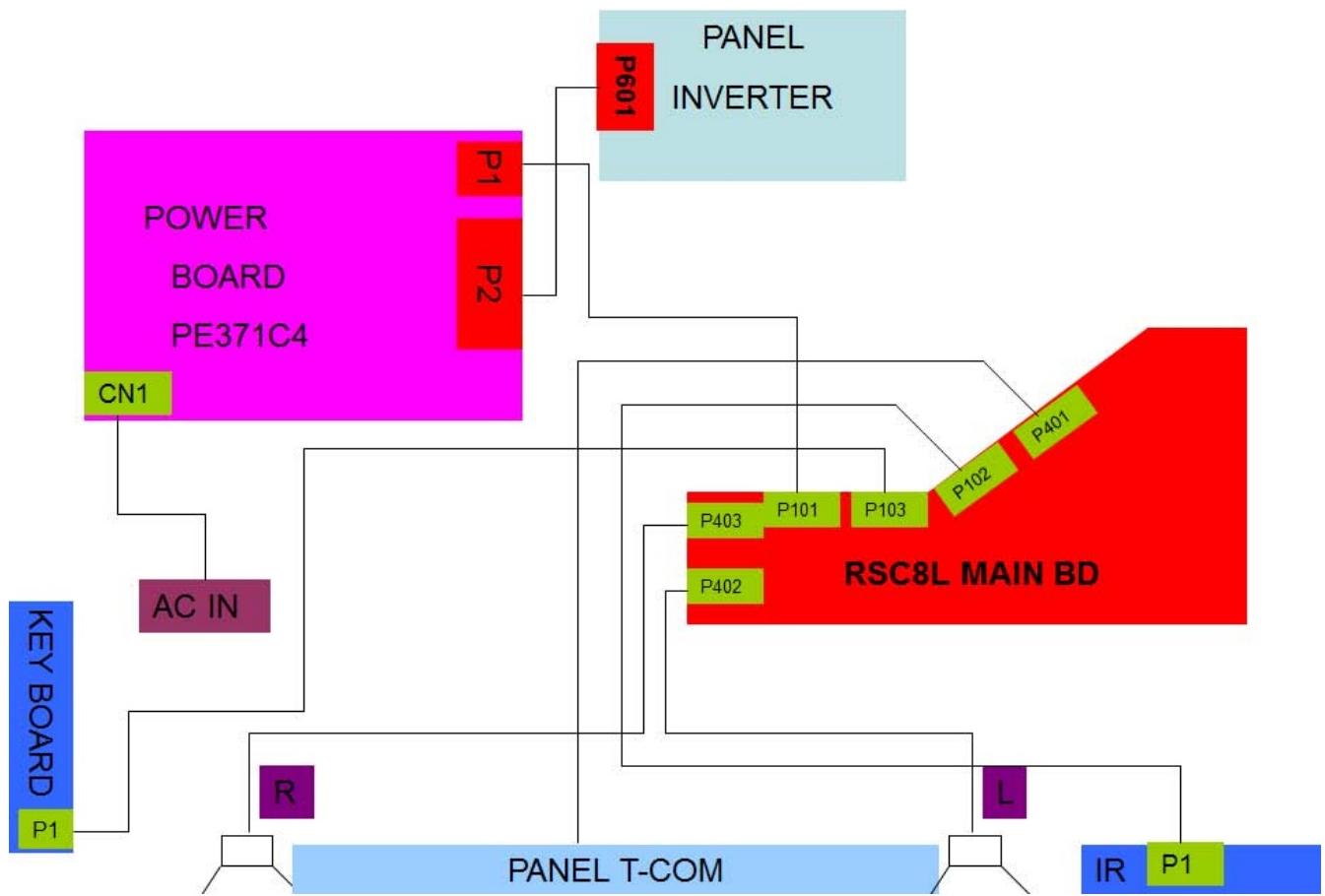
3.2 The pack model exploded drawing

Check the Attachment 1-2

3.2 The base model exploded drawing (Base Assembly Instructions)



4. Wiring Diagram



5. Disassembly Procedure

5.1 Removal Of Mechanical Parts

1. Remove the back cover.

Remove 10 screws(ST3x6)[1] for RC&PANEL;

Remove 6 screws(ST3x8)[2] for RC& FC

Remove 2 screw(B3x6)[3] for RC& AV bracket;

Remove 2 screw(ST3x8)[4] for RC&AC bracket;

Remove 4 screw(B6x10)[5] for RC&VESA bracket;

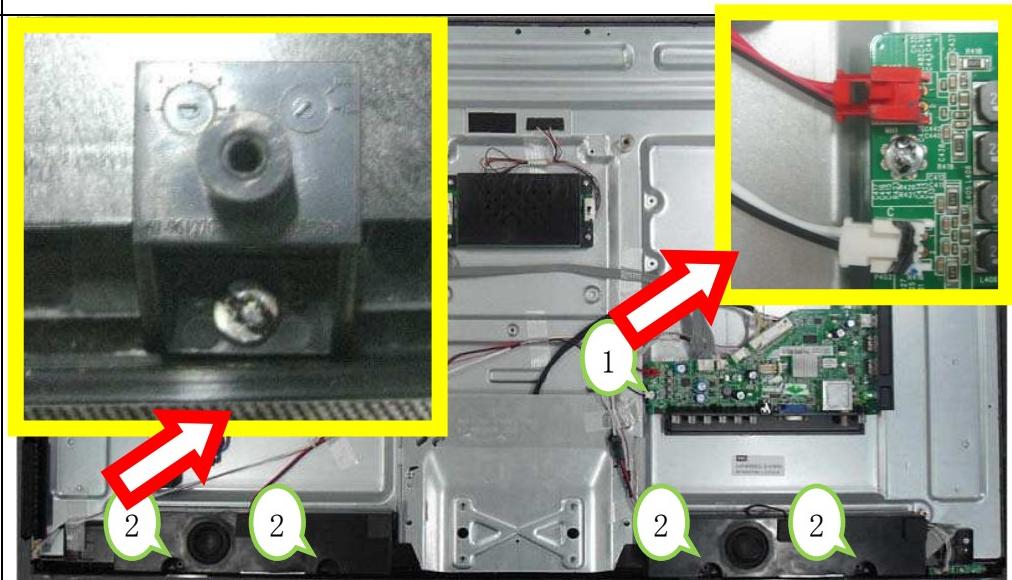


2. Remove the 2 speakers.

Unplug the speaker wire[1];

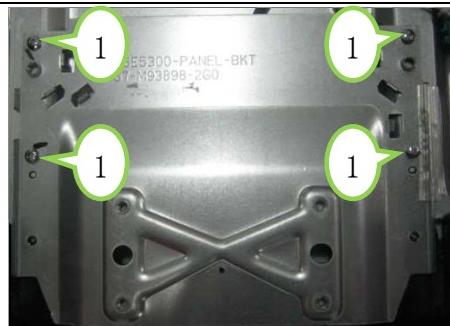
Remove 4 screw(ST3x14)[2] for speaker socket support and FC;

Take out 2 speakers from the front cabinet



3. Remove the table stand bracket.

Remove 4 screw(B4x10)[1] for the table stand bracket & PANEL;

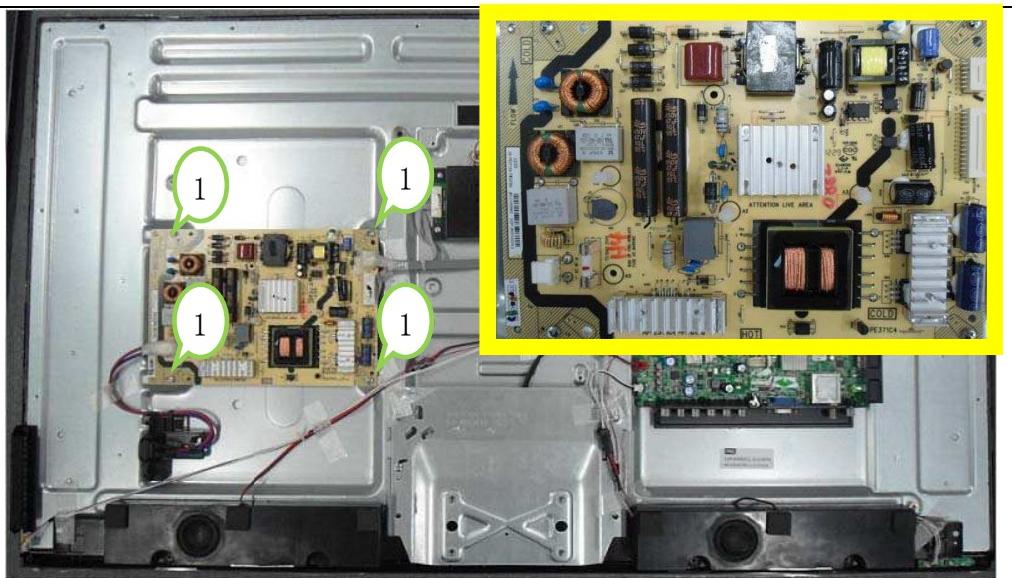


5.2 Removal Of PCB Module

- Take off the PSU BD.

Unplug the wire from PSU BD ;

Remove 4 screws(B3x6)[1] for PSU BD and panel;



- Take off the main BD

Unplug all wire from main BD;

Remove 2 hexagonal nuts (M3x5x2.3)[2] for main BD bracket &panel.

Remove 2 screws(B3x6)[2] for main BD& panel.

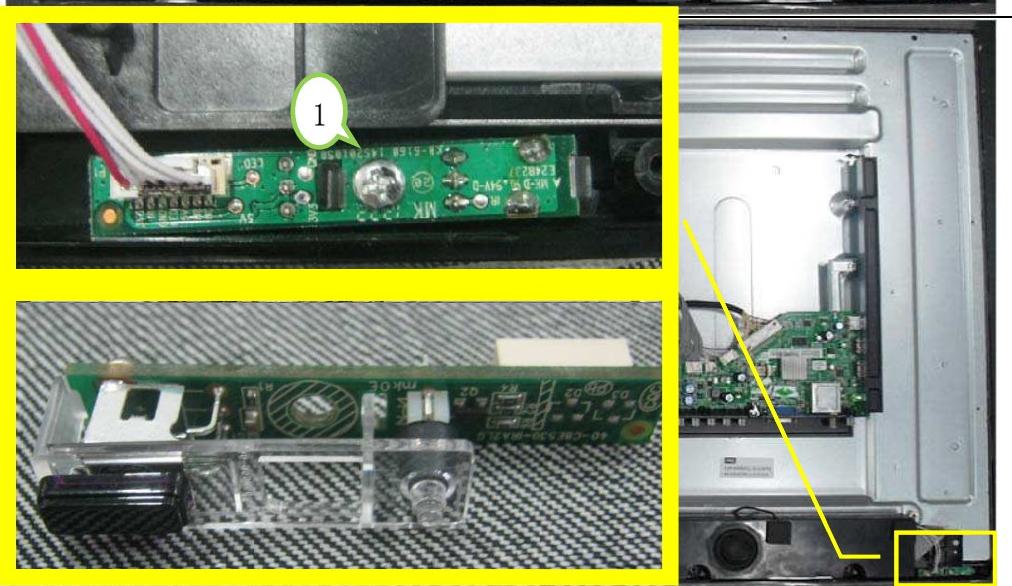


- Take off the IR BD

Unplug the IR wire from the key ass'y;

Remove 1 screws(B3x6)[1] for IR BD& IR bracket.

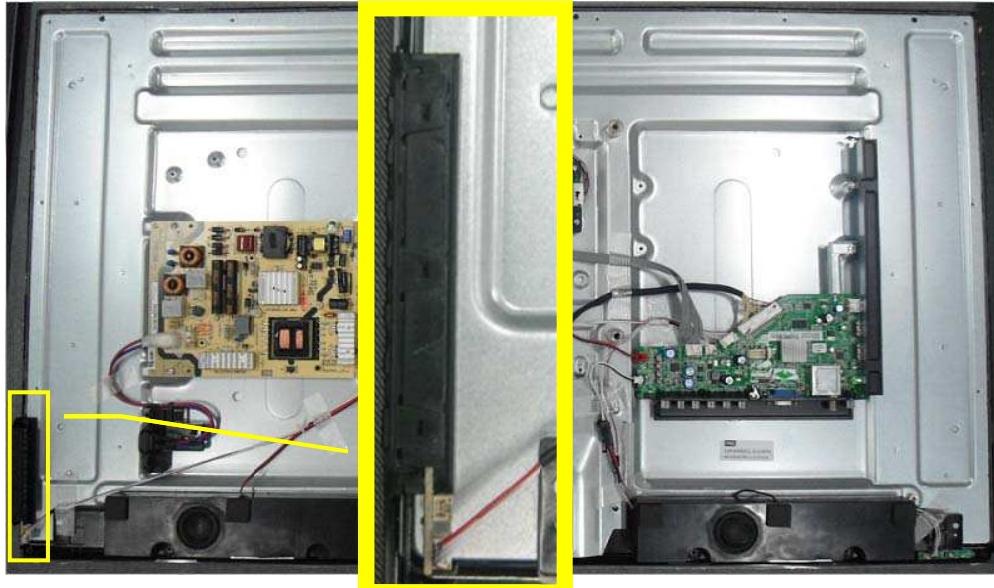
Take out the IR BD from IR bracket.



4. Take off the KEY BD

Unplug the KEY wire
from the key ass'y;

Take out the KEY
BD from FC.



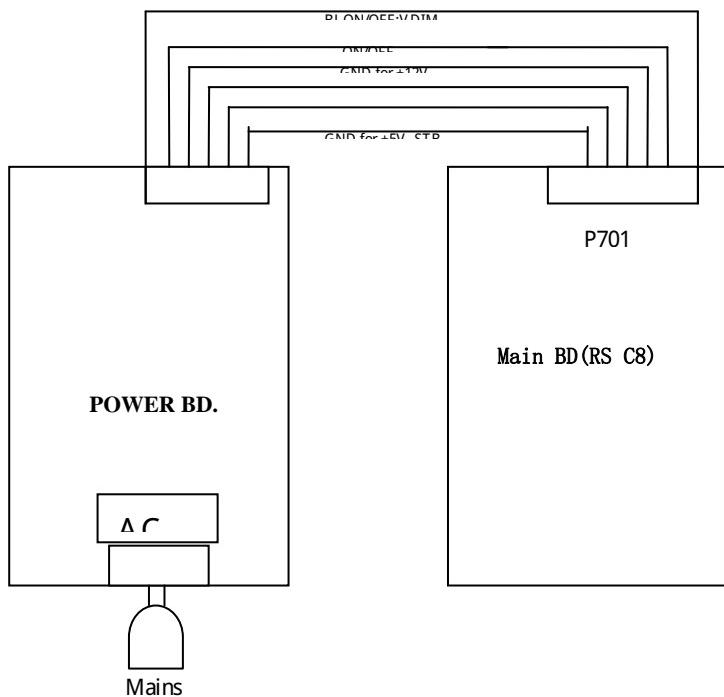
5.3 Removal Of Panel

1. Remove all wires,
adhesive tapes,
insulation file,
aluminum foil and
others on the
panel's back.
Remove 14 panel
holders [1], then
lift the panel from
the front cabinet.



6. Adjustment Procedure

6.1 Power supply



All the Model Standard Power supply is +24V and +3.3V for the MainBD.

With 120V AC input, +5V or +3.3V is always available .

ON/OFF signal enables the +12V and the other Voltage.

- If ON/OFF signal = 0V, +24V and the other are not available.
- If ON/OFF signal = 3.3V, +24V and the other are available.

6.2 ELECTRICAL TEST

1.1 Abbreviations

HD	High Definition
SD	Standard Definition
VGA	Video Graphic Adapter
VESA	Video Electronics Standards Association
RC	Remote Control
TBD	To be determined

1.2 Preparation

Connect LVDS cable from LCD panel to P401*For RSC8L

Some model need connect +24V supply cables to the inverter unit of LCD panel.

Connect DC/DC&CONTROL cable from Power Board to P101 (Main board.).

Connect IR cable from P102 to IR BD.

Connect KEY cable from P103 to KEYBOARD

Connect SPEAKER cable to P402& P403.

1.3 Key Board, IR receiver and RC

Apply 120V AC to mains input, when power on, LED should light up with Blue color.

1.3.1 To navigate the MENU using KEYBOARD

A > To switch on/off the TV set:

Action: Press Power key on keyboard

Observe: Power key is equal to ON-OFF on remote control.

B > To enter MENU Screen:

Action: Press MENU key on keyboard.

Observe: Menu screen should shown at LCD screen.

C > During Menu Screen:

Action: Press Menu key

Observe: Menu key is equal to OK key on remote control.

Action: Press Vol- key

Observe: Vol- key is equal to LEFT key on remote control.

Action: Press Vol+ key

Observe: Vol+ key is equal to RIGHT key on remote control.

Action: Press PR- key

Observe: PR- key is equal to DOWN key on remote control.

Action: Press PR+ key

Observe: PR+ key is equal to UP key on remote control.

1.3.2 To navigate the MENU using REMOTE CONTROL

A > To enter MENU Screen.

Action: Press MENU key in remote control

Observe: Menu screen should shown at LCD screen.

B > During Menu Screen:

Action: Press UP key or DOWN key

Observe: Highlight will goes up and down

Action: Press RIGHT or OK key

Observe: User will enter to the selection highlighted.

Action: Press GO BACK key(shortcut key)

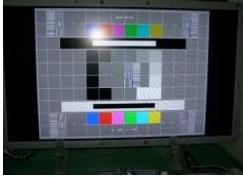
Observe: User will exit from the selection.

1.4 Video functional check

1.4.1 PC(Only TA Series)

Standard Monitor Format (VESA)

Connect VGA cable with VESA format to P301 and R/L to P302 Change the display source to PC.

Test Pattern	SMPTE	64-step greyscale
		
	(Generated by Quantun882)	(Generated by Quantun882)
Format	640x480@60Hz 800x600@60Hz 1024x768@60Hz 1360x768@60Hz(HD) 1920x1080@60Hz(FHD)	640x480@60Hz 800x600@60Hz 1024x768@60Hz 1360x768@60Hz(HD) 1920x1080@60Hz(FHD)

1.4.2 YPbPr

Connect Y, Pb, Pr signals to connector P 204(CMPT) (Green/Blue/Red, Audio input connect to White/Red)

Change the display source to CMPT1.

signal Parameter	Source Impedance	Minimum (V p-p)	Typical (V p-p)	Maximum (V p-p)
Y : Sync to Peak White	75 ohm	0.67	0.70	0.73
P _R : Sync to Peak White	75 ohm	---	0.30	---
P _B : Sync to Peak White	75 ohm	---	0.30	---

Test Pattern	SMPTE RP-133		32-step greyscale	
Picture				
	(Generated by Chroma2327)		(Generated by Chroma2327)	
Format	4:3	16:9	4:3	16:9
	480i@59.94Hz	1080i@60H	480i@60Hz	
	480p@59.94Hz	720p@60Hz	480p@60Hz	1080p@60HZ

1.4.3 HDMI

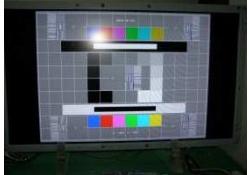
2.5.3.1 DVI mode

Standard Monitor Format (VESA)

Connect HDMI cable with TMDS signal in VESA format to P202 and R/L to P302

Change the display source to HDMI1.

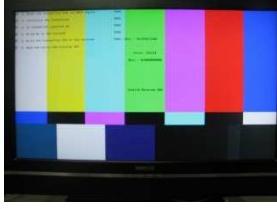
Test Pattern	SMPTE	64-step greyscale
		16 / 49

		
Format	640x480@60Hz 800x600@60Hz 1024x768@60Hz 1360x768@60Hz(HD) 1440x240@60Hz	640x480@60Hz 800x600@60Hz 1024x768@60Hz 1360x768@60Hz(HD) 1440x240@60Hz

2.5.3.2 HDMI mode

Connect HDMI cable with TMDS signal in VESA format to P201.

Change the display source to HDMI 1

Test Pattern	SMPTE	64-step greyscale
		
	(Generated by Quantun881)	(Generated by Quantun881)
Format	4:3	16:9
1H	480i@60HZ	1080i@60Hz
2H	480p@60Hz	720p@60Hz/1080p@60HZ

1.4.4 RF

2.5.4.1 Analog RF signal input

Connect Antenna cable to tuner.

Change the display source to TV Channels.

Test Pattern	Depended on factory	Depended on factory	Depended on factory
Channel			
Picture Frequency			
Channel band	VHF-L	VHF-H	UHF

2.5.4.2

Digital RF signal input

Connect Antenna cable to tuner.

Change the display source to TV Channels.

Test Pattern	Depended on factory	Depended on factory	Depended on factory
Channel			
Picture Frequency			
Channel band	VHF-L	VHF-H	UHF

1.4.5 CVBS

2.5.5.1 CVBS input

Connect AV cable with CVBS and audio L, R signal to P203 (Y yellow/White/Red)

Change the display source to AV1

Test Pattern	SMPTE RP-133	32-step greyscale
Format	NTSC M (Generated by Chroma2327)	NTSC M (Generated by Chroma2327)

2.5.5.3 SIED AV input

Connect AV cable with CVBS and audio L, R signal to P501 (Yellow/White/Red on side AV BD) .

Change the display source to AV 2

Video test pattern is the same as section 2.5.5.2.

6.3 Video Alignment

On RSC8 platform, Alignment items could be achieved by using serial port with UART protocol, P301 (VGA) socket could be used for UART purpose, pin definition as below:

Pin 4---RXD;

Pin 11---TXD;

Before doing the alignment, you must ensure the Project ID is right, this point is very important.

1.5 Alignment Conditions

In order to have defined conditions for the alignment procedure, the TV set should be warmed up for 30 minutes.

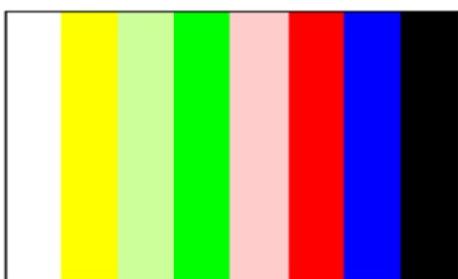
1.6 ADC Calibration

ADC calibration should be applied just for CMPT and PC channel:

1.6.1 Input signal spec.

: ADC Mode: CMPT : 720@60Hz & PC : 1024*768@60Hz

: Pattern: 100/0/100/0 8 Steps Color bar (100%)



1.6.2 Step for CMPT ADC calibration

- Input 100% color bar of 720P60 format to CMPT1 source

- Entry factory menu and choose the ADC menu with the RC
- Change ADC Source to `CMPT_
- Adjust the cursor to `AUTO Color_, press `ok/_Right_ key on the RC
- `Please wait_ _ will display
- If Ok, ADC `status_ item will show `OK_
- If FAIL, do one more time till it shows OK

1.6.3 Step for PC ADC calibration(Only TA series)

- Input 100% color bar of 1024*768@60format to PC source
- Entry factory menu and choose the ADC menu with the RC
- Change ADC Source to `PC_
- Adjust the cursor to `AUTO Color_, press `ok/_Right_ key on the RC
- `Please wait_ _ will display
- If Ok, ADC `status_ item will show `OK_
- If FAIL, do one more time till it shows OK

1.7 White balance

On RSC8 platform, Only Normal temperature must to been adjusted, the Warm & Cool data will be change to with some default offset, but these offset also should been changed according to the manufacture condition. Normally The CCFL LCD model temperature should been these spec:

Color Co-ordinates	Standard
X	283±15
Y	291±15

Remark:

The Cool Co-ordinates is: X=272, Y=278, the tolerance is:-10~+30;

The Warm is: X=314, Y=324, the tolerance is:-10~+30.

This standard is only for CCFL panel, the LED Panel must be use the Panel Team Data.

The Appendix 5 is some detail data.

1.7.1 CUT-OFF ALIGNMENT

Cut-off alignment is used to define the color co-ordinates for low luminance level. This alignment has to be done for the following standards:

1. Insert a grey test pattern with 25IRE signal amplitude
2. Measure the color co-ordinates near the center of the screen
3. Adjust with `R_Offset_, `G_Offset_ and `B_Offset_ to above color co-ordinates values.

1.7.2 White balance

This alignment has to be done for the following standards:

1. Insert a grey test pattern with 80IRE signal amplitude
2. Measure the color co-ordinates near the center of the screen.
3. Adjust with `R_Gain_, `G_Gain_ and `B_Gain_ to the following color co-ordinates values:

Source	HDMI	CMPT/AV/TV/PC	REMARK
Color Temp	Normal	Normal	
R-gain	0~255	-128~+127	Need to adjust
G-gain	128	0	Not need to adjust
B-gain	0~255	-128~+127	Need to adjust
R-offset	0~255	-128~+127	Need to adjust
G-offset	128	0	Not need to adjust
B-offset	0~255	-128~+127	Need to adjust

- The default values have a close relation with panel brightness. After white balance alignment, a picture performance check should be done: the brightest scales of 16-scale grey pattern should be distinguishable in vibrant mode (max contrast), and the light output at OOB(out of box) use whole white signal (white 100 IRE), it should be more than 350nits.
- Before white balance alignment, we must make sure ADC calibration had been done.
- The white balance values in normal of HDMI are the base of other value, the other sources are the offset on Normal of HDMI, so we must adjust normal of HDMI first, then other source should be adjusted in the end.

- The ADC and white balance source setting: HDMI source is HDMI1, the CMPT source is CMPT1, AV source is AV 1.
- Since the White Point and Offset alignments are influencing each other, an iterative process maybe needed to get both alignments to the required values.
- White balance status: picture preset is vibrant, Dynamic Backlight & light sensor is off.
- Advises for adjust while balance: make sure values of “G GAIN_ / G OFFSET using default value ,the Normal temperature should been not adjust .but sometime the Warm temperature maybe adjust.

6.4 Audio Alignment

P302: INPUT PORT FOR DVI (HDMI1) & PC

P305: DIGITAL COAXIAL AUDIO OUTPUT

6.5 Shop initial (USELESS)

1.8 Shop initial should be done at the last alignment.

- Enter the factory menu `Factory menu_
- Choose `SHOP_ and press `ok_ key on the remote control
- Shows `ok_ on the screen, exit factory menu
- Then power down.

OUT OF BOX SETTINGS

ITEM	TTING					
1.PICTURE						
Picture Settings	Vibrant	Cinematic	Natural	Sports	ECO	personal
Brightness	50	50	50	50	50	50
Sharpness	30	40	50	60	50	30
Contrast	80	50	75	80	50	80
Expect Setting...						
BackLight	100	100	100	100	100	100
Color	50	50	50	45	50	50
Tint	0	0	0	0	0	0
Color Temperature	0					

Advanced setting...	
Light sensor	On
Dynamic Backlight	On
Noise Reduction	Auto
Reset Picture Setting...	Ok Or Cancel
2.SOUND	
Equalizer	Standard
Balance	0
Surround	ON
Speaker	ON
SPDIF	Dolby Digital
Auto Volume Control	Off
Analog TV Sound	Stereo
3.Setup	
Signal Type	Cable
Channel Scan	start
Channel Skip...	
	Channel List 1~135(Cable)
Channel Edit...	
	Channel List 1~135(Cable)
Input Skip...	
	List All Source Input
Input Label...	
	List All Source Input
Closed Caption...	
CC Setting	On when muted
Digital CC Type	Off
Digital CC Preset	On
Digital CC Style	Caption style
	Digital CC Size
	Digital CC Font
	Digital CC Color
	Digital CC Opacity
	Digital CC Background Color
	Digital CC Background Opacity
	Window Color
	Window Opacity
Time Setup	1:00AM

Time Zone	Estern	
Timeǔ	Auto Synchronization	On
	Date	
	Time	
	Power On Timer	Off
	Power On Time	
	Power Off Timer	Off
	Power Off Time	
Sleep Timer	Off	
Reset Allǔ		
5.PARENTAL CONTROL		
Password	1234	
Channel Blockǔ		
Button Block	Off	
V-Chipǔ ..		
Input Blockǔ		
Change Passwordǔ		

6.6 Factory Menu

1.9 How to enter factory menu by remote control

- ✓ Menu On and inside to Picture Menu

Then inside Picture Setting Menu

And move the cursor to Expet Setting, select Contrast item.

Press the Password `9735` (should be finished in 3 seconds)

- ✓ Press `Go back` key on the remote control directly when FACTORY MODE HOTKEY set ON (while the character "P" displaying on the blow-left of the screen).

1.10 To go back or exit factory menu:

- ✓ Press `MENU` key on the remote; [the `CLEAR` key will exit factory menu directly.](#)

6.7 Service menu

1.11 How to enter service menu by remote control

- ✓ Menu On and inside to Picture Menu

Then inside Picture Setting Menu

And move the cursor to Expet Setting, select Contrast item.

Press the Password `9705` (should be finished in 3 seconds)

1.12 To go back or exit service menu:

- ✓ Press `MENU` key on the remote; [the `CLEAR` key will exit factory menu directly.](#)

6.8 ALL THE D-MODE MENU AND SETTING:

1.13 Main\Factory

ITEM	STATE	COMMENT	REMARK
Factory mode hotkey	OFF	when set On, we can enter factory menu with pressing_OK_on remote control directly.	Factory out :OFF
WARM-UP	OFF	Aging mode ON:The flashing character PW and the time of aging display on the below-left of the screen.	Only in TV source will display noise picture when WARM-UP set on Disable on designer mode Factory out :OFF
ADC	.....	Analog to digital calibration	Only CMPT and PC
White Balance	.....	For bright and low luminance level adjust	
SHOP	DO	Initialize production.	Do it at the last position of the product line, HOT KEY will be disable.
NVM reset	DO	Factory mode data reset	It will be done before shop initial if need
Preset Factory Ch	DO	Preset Factory Channel data	Only HZ factory
POWER ON Mode	LAST	STB: Standby ON: power on directly when plugging in the wire. LAST: For last memory power on/off mode	Set 'On_ when aging in the test, and set 'Last_ when factory out.
USB update	.....	Use the USB to Update software. we can enter the menu after pressing_OK_on remote control directly.	
Tuner Select	AUTO	AUTO: the software auto config the tuner through I2C read the tuner data; TCL: the software config the tuner according to the	The set is AUTO when factory out.

		TCL tuner. Panasonic: the software config the tuner according to the Panasonic tuner.	
--	--	--	--

1.13.1 Main\ Factory\ADC

ADC CALIBRATION			
ITEM		COMMENT	REMARK
ADC Mode	Y UV /PC	720P/1024x768@60Hz	Only in CMPT1 & PC
Auto ADC		Adjust if need	Shows result
SD STATUS	NG	Not need to adjust	If it is OK means Y UV ADC calibration is pass
HD STATUS	NG	Not need to adjust	If it is OK means Y UV ADC calibration is pass
R GAIN	47(0~128	need to adjust	
G GAIN	47(0~128	need to adjust	
B-GAIN	47(0~128	need to adjust	
R Offset	64(0~128	need to adjust	
G Offset	64(0~128	need to adjust	
B Offset	64(0~128	need to adjust	

1.13.2 White Balance....

White Balance			
ITEM		COMMENT	REMARK
White balance Init	DO/OK	Press :OK `on RC when this item set :DO`until it change to `OK`	Only when this item set :OK `can we adjust the white balance
SOURCE	HDMI	CMPT/PC /AV	480i/1024*768 /NTSC-M must adjust HDMI, the other maybe not to change
Color Temp	Normal	Normal	Each source must adjust normal first.
R GAIN	128(0~255)	0(-128~+128)	Normal of HDMI is the basic data of white balance of every source.

G GAIN	128(0~255)	0(-128~-+128)	Normal of other source is the offset on normal of HDMI too.
B GAIN	128(0~255)	0(-128~-+128)	
R Offset	128(0~255)	0(-128~-+128)	
G Offset	128(0~255)	0(-128~-+128)	
B Offset	128(0~255)	0(-128~-+128)	
Brightness offset	0	0	No need to modify
Contrast offset	15	.....	No need to modify
ADC SD status	.....	.....	This is ADC status
ADC HD status	.....	.....	This is ADC status

1.13.3 USB update

1.14 Service menu

Service menu			
ITEM		COMMENT	REMARK
USB Update	... .....	Update the software	The bin file must is 'AllCompBase.bin_ and the file must locate at USB content
Project ID	... .....	Need select the project ID	There are many Models

Note: these change would working until the TV reset.

6.9 INFO

INFO				
Parameter			COMMENT	REMARK
C8:	.....	V8-0RSC801-LF1V ***	Main program	*** shows version
SVN REVISION	V ***		The source code version in SVN server	***shows version
DATE	Nov 18 2010		Release time	

Note:

- After EEPROM INIT Channel map change back to the non-receive status. The data set as the default value.
- The WARM-UP is enable when both FACTORY MODE HOTKEY and WARM-UP set on
- If WARM-UP STATUS is on, also the full 16:9 display is kept.

Channel preset on Air mode In HZ factory:

Channel	Frequency	Format	The US Ch Map
5	77.25	NTSC M	Air Ch Map no.5
6	83.25	NTSC M	Air Ch Map no.6
29	253.25	NTSC M	Air Ch Map no.29
45	657.25	NTSC M	Air Ch Map no.45
62	759.25	NISC M	Air Ch Map no.62

1.15 The following IC should be pre-copied before SMT process:

POSITION	IC BOM	BOM
FOR U802(Main BD)	13-EN25Q3-2AB	V8-0RSC801-LF1V ***

6.10 High Pot and Insulating Resistance Tests

At the end of the process, a High Pot tests are required for matching Safety Electrical

High Voltage Withstanding requirements

Voltage **3.5KV AC**

Max Leakage Current **10 mA**

Test Time **5 sec**

Appendix1: SURVEY OF INDEX CHANG

Revision	Page	Survey of index change	Changed by	Remark
Draft	19		DC	2011/1/28
KET	19		Wly	2011/12/27
For Korea	19		Cyril	2012/6/18
For Sanyo	19		Cyril	2012/8/11
For Sanyo V2.0	19	Modify the white balance coordinator	Cyril	2012/8/29

Appendix 2: Color Temperature Standard

Mode	Normal	Cool	Warm
FV M4012	X:0.287±0.007 Y:0.295±0.007	X:0.276,-10~+30 Y:0.286,-10~+30	X:0.298,-10~+30 Y:0.312,-10~+30

7. Firmware Update SOP

- When updating Software without TV Set, the indicator light will be flash/dark/bright while the program is updating/fall down on updating/success in updating.
- How to update Software when TV is Power ON, there are 3 method to do this:

7.1 Auto update

1. Copy the software (AllCompBase.bin) into USB (root directory);
2. Turn on the TV set.
3. Insert USB into TV set;
4. a few later the update menu will appear, shown as figure 1.1

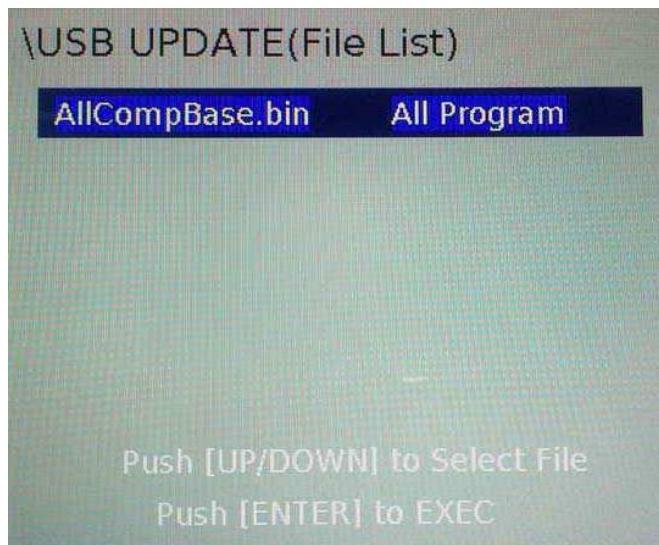


fig. 1.1

5. Select AllCompBase.bin and Press OK, the process will shown as figure 1.2.

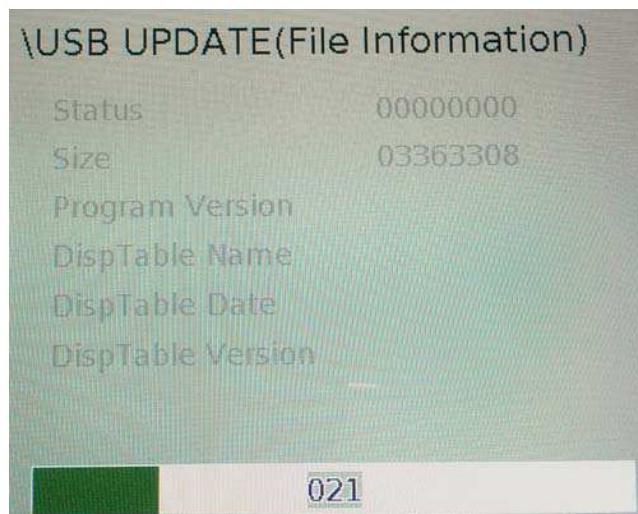


Fig. 1.2

Notice: Do not power off during updating

10. When it finished, it will display 'Completed!' information, shown as figure 1.3.

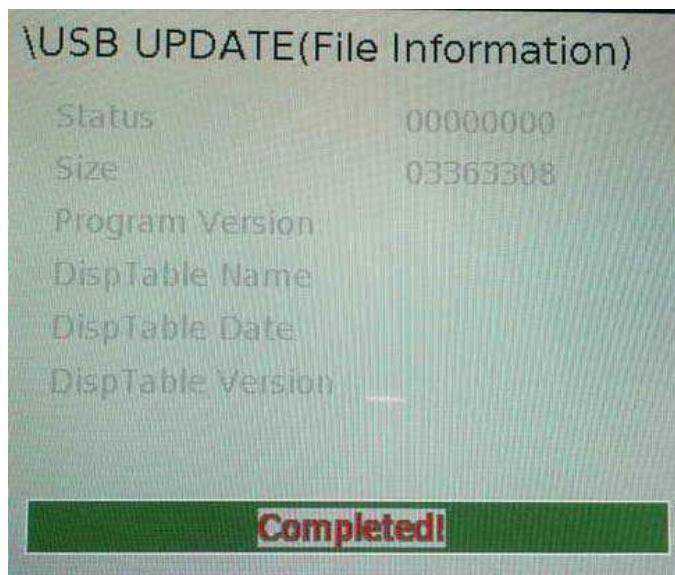


Fig 1.4

11. Pull out the USB device, and reset TV set.

7.2 Factory Update

- 1、enter the factory;
- 2、Select 'USB UPDATE' .

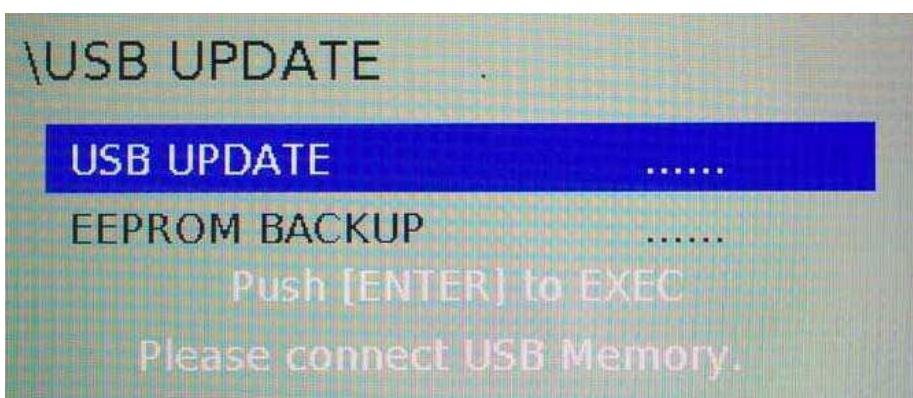


Fig 1.5

- 3、the next step is same as 7.1 step 4

7.3 Service Update

- 1、enter the service menu;
- 2、Select `USB UPDATE`

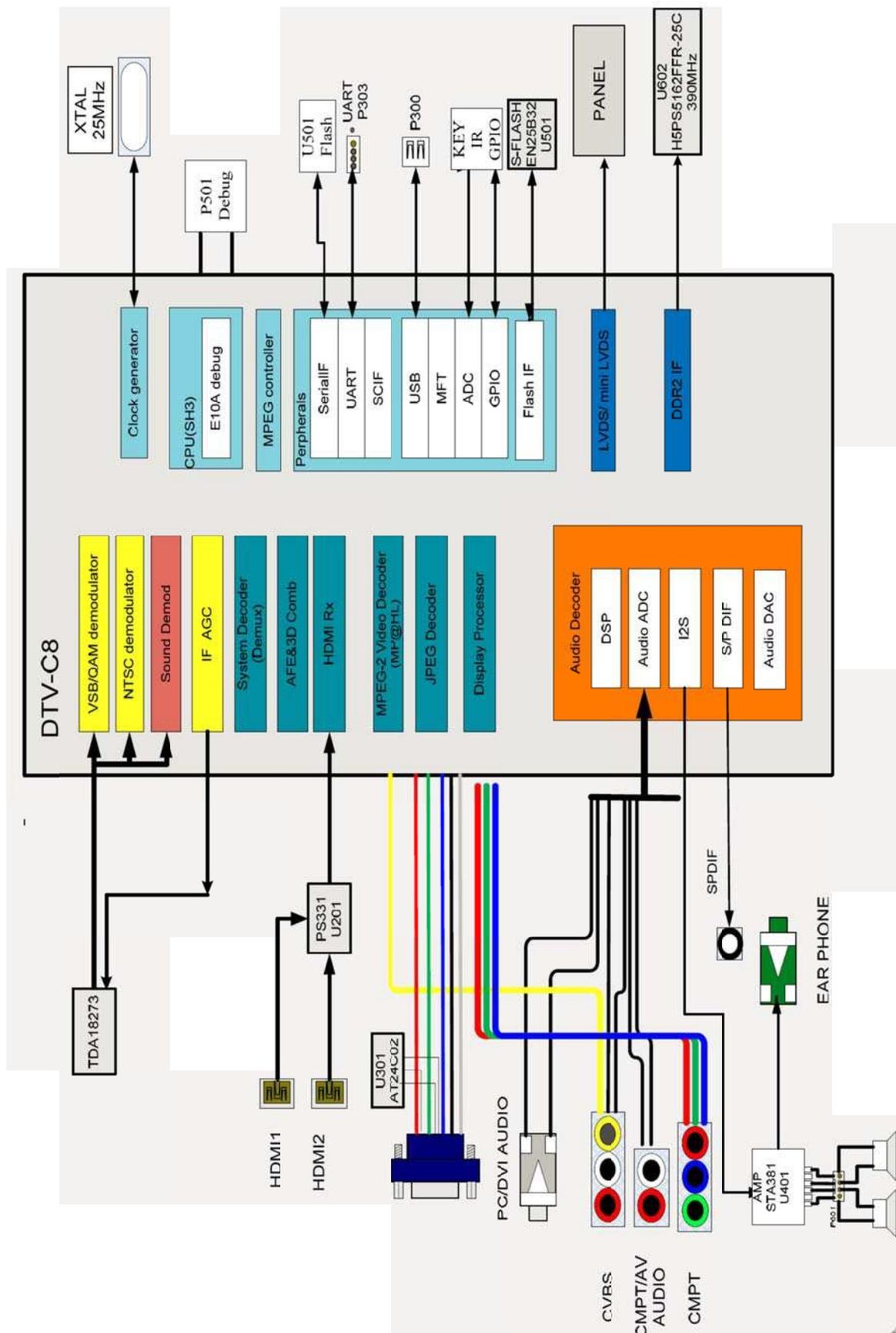


Fig 1.6

- 3、the next step is same as 7.1 step 4.

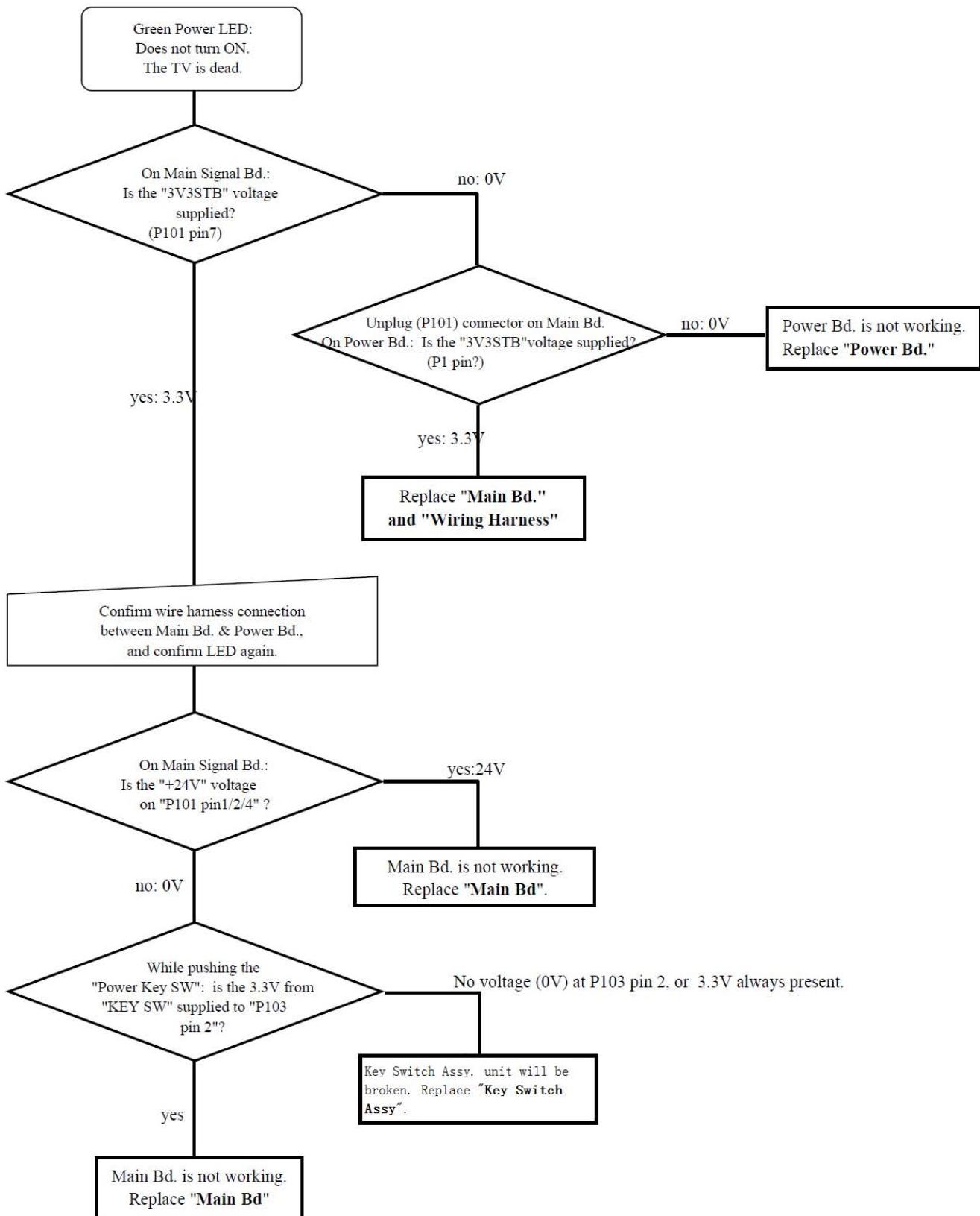
Note: if the process is not success or power off in process, the next Power On will load the backup software from flash and only display the update menu.

8. Block Diagram

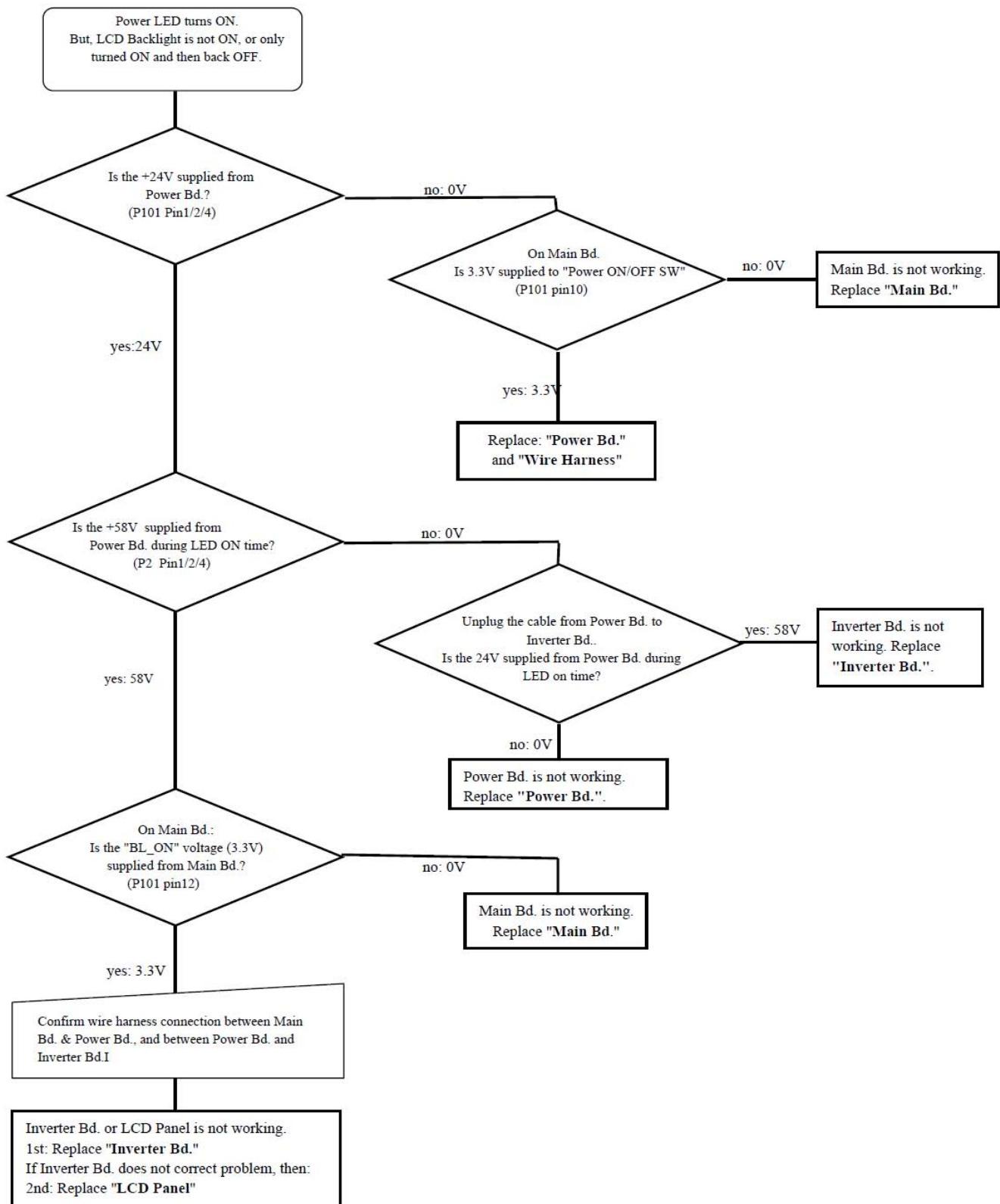


9. Troubleshooting Flow Chart

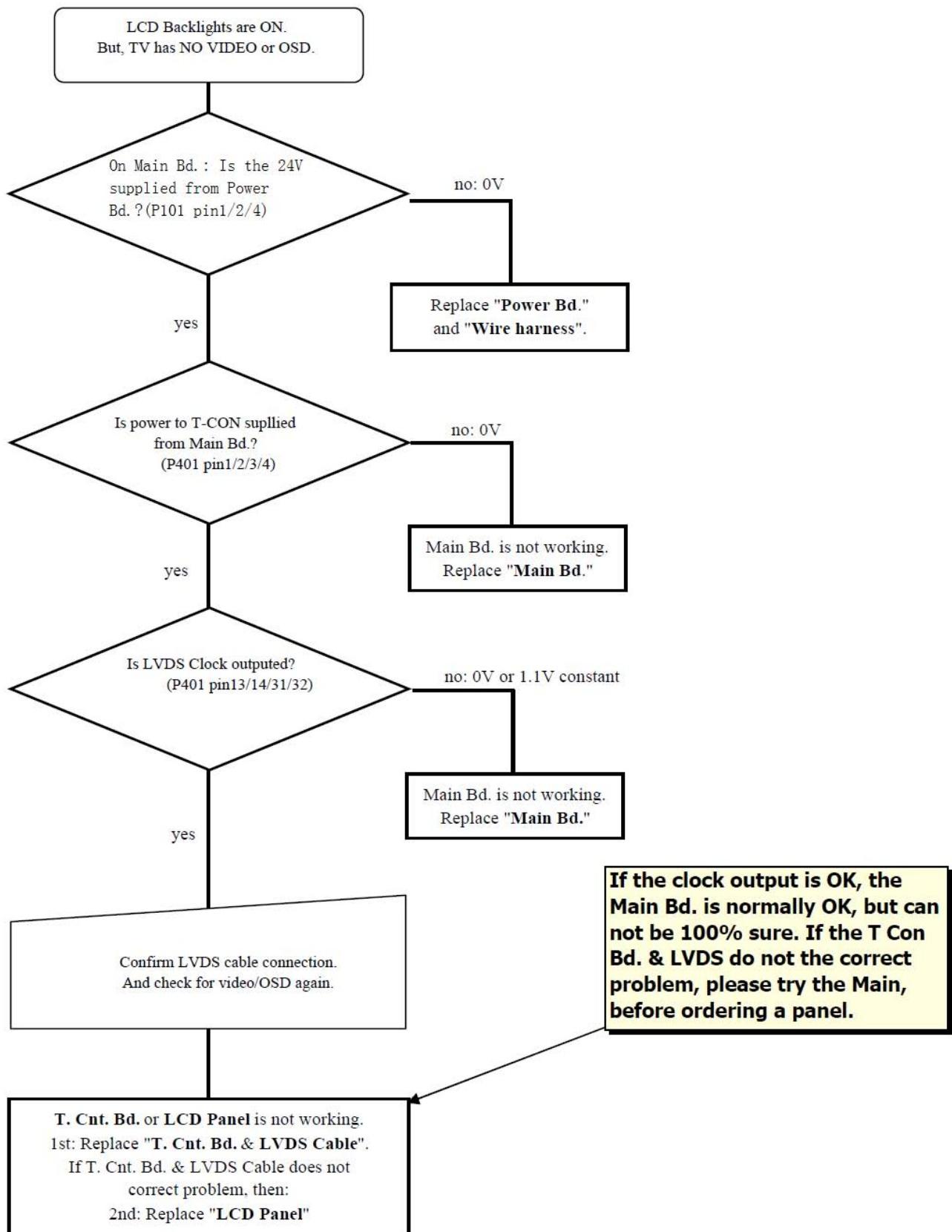
9.1 Green Power LED does NOT turn on. The TV is dead



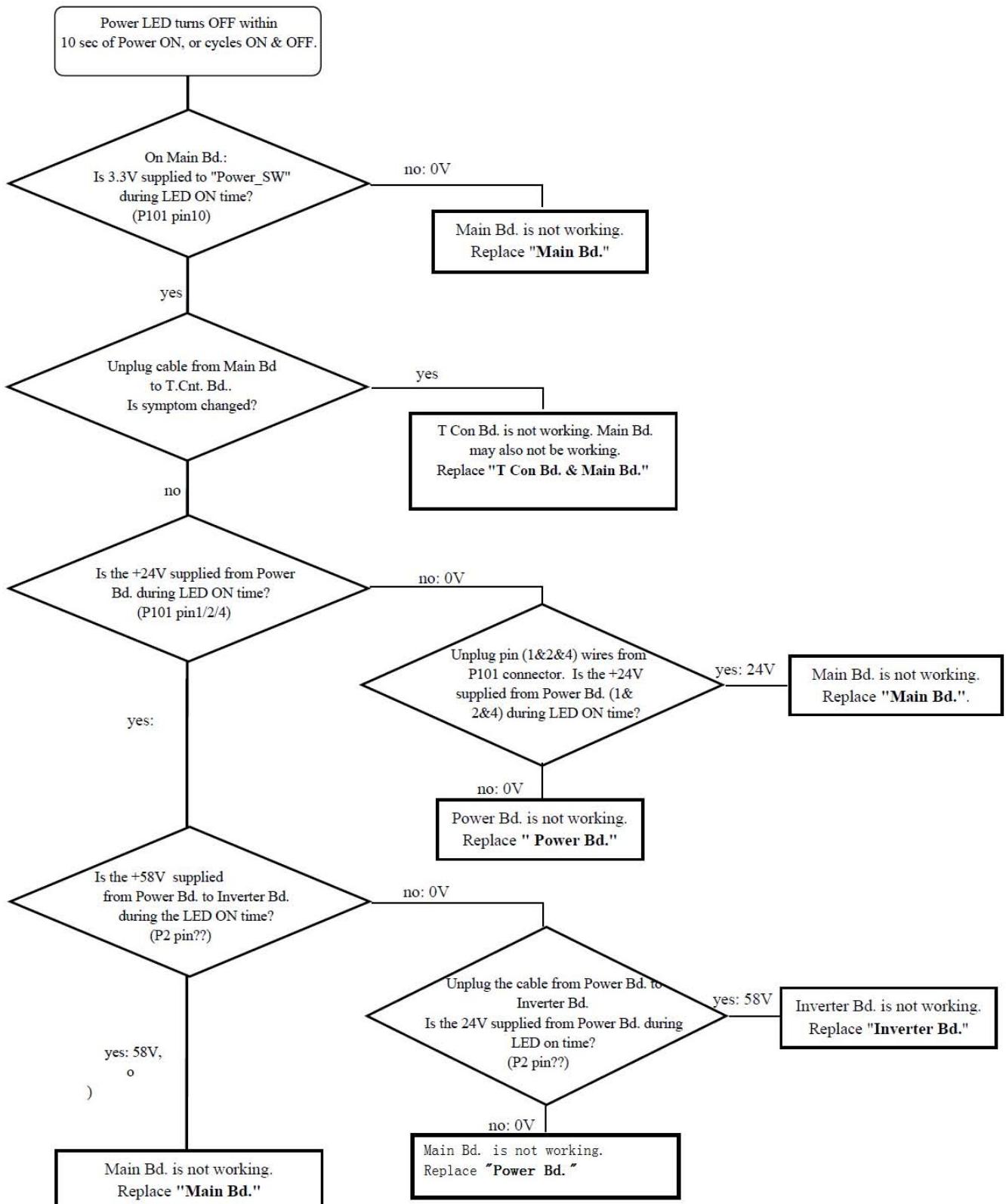
9.2 Green Power LED is on, but LCD backlights are not on. Backlight do not turn on, or only turn on and back off.



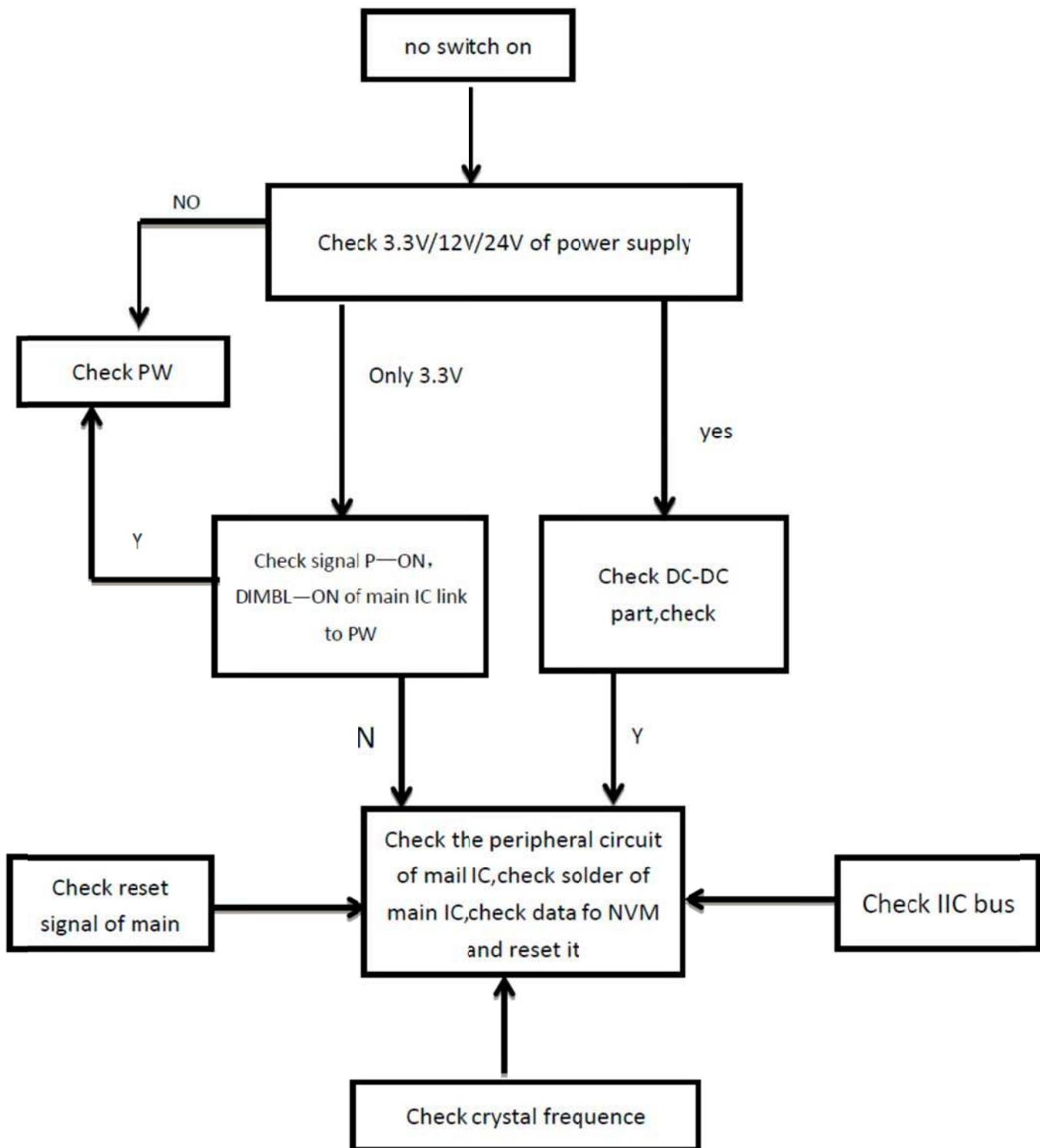
9.3 Green Power LED and LCD backlights are on, but no video or OSD.



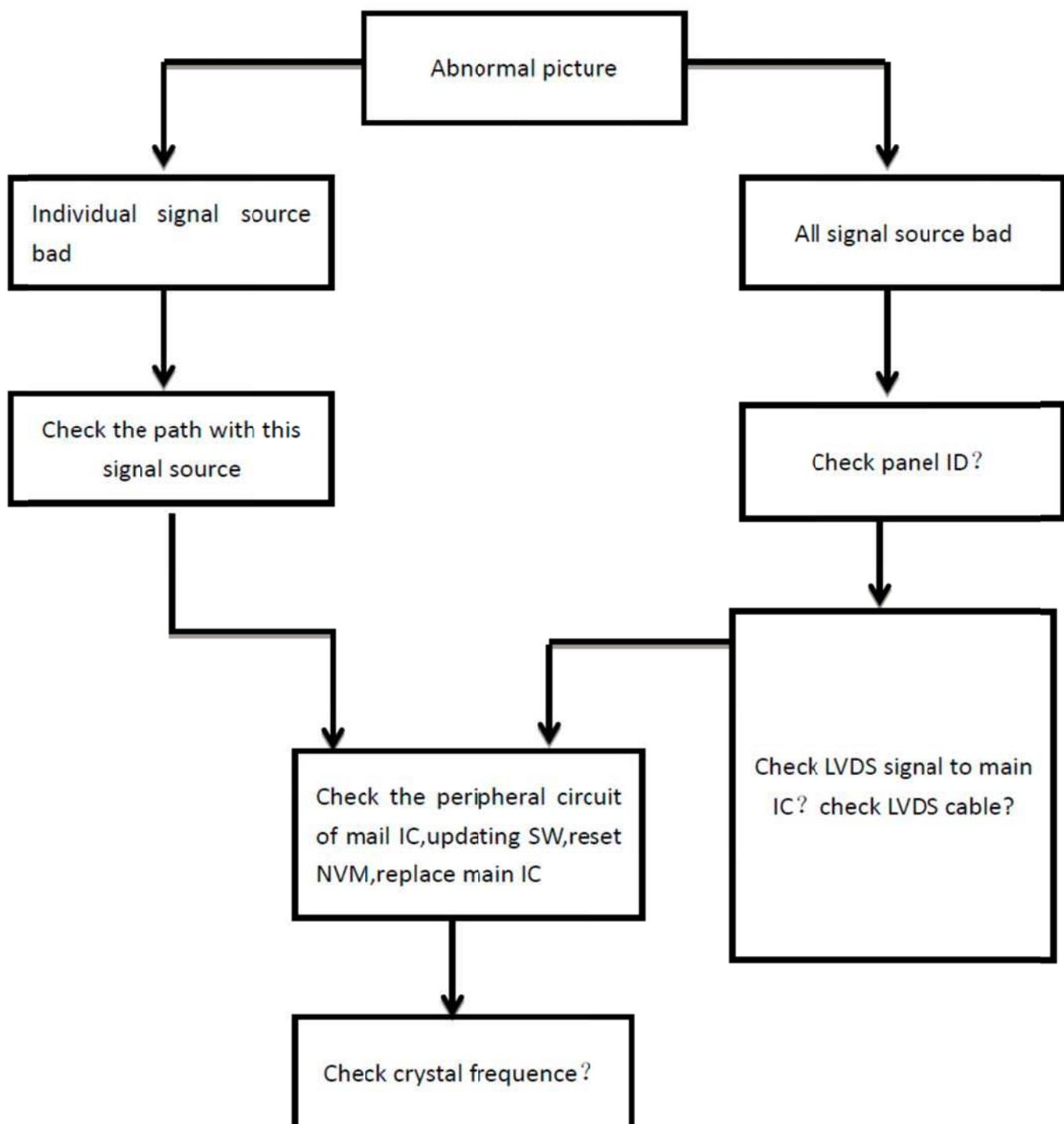
9.4 Power LED turns OFF within 10 sec of Power ON, or LED cycles ON & OFF.



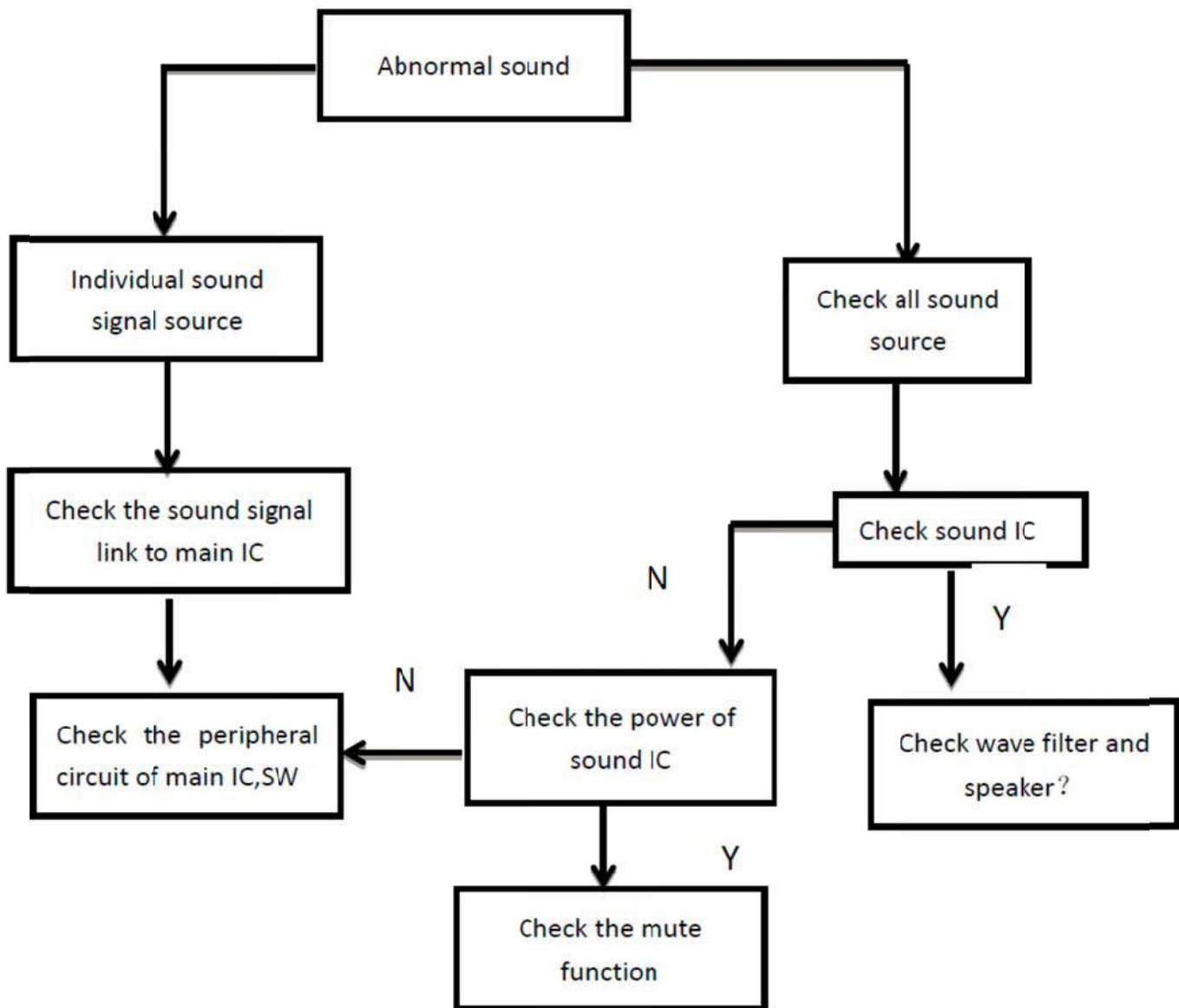
9.5 Cannot switch on



9.6 abnormal picture



9.7 Abnormal sound



10. Schematic Diagrams

10.1 The main BD SCH

Check the Attachment 2

10.2 The power BD SCH

Check the Attachment 3

10.3 The key BD SCH

Check the Attachment 4

10.4 The IR BD SCH

Check the Attachment 5

10.5 The DR BD SCH

Check the Attachment 6

11. PCB Layout Diagrams

11.1 The main BD PCB Layout

Check the Attachment 7

11.2 The power BD PCB Layout

Check the Attachment 8

11.3 The key BD PCB Layout

Check the Attachment 9

11.4 The IR BD PCB Layout

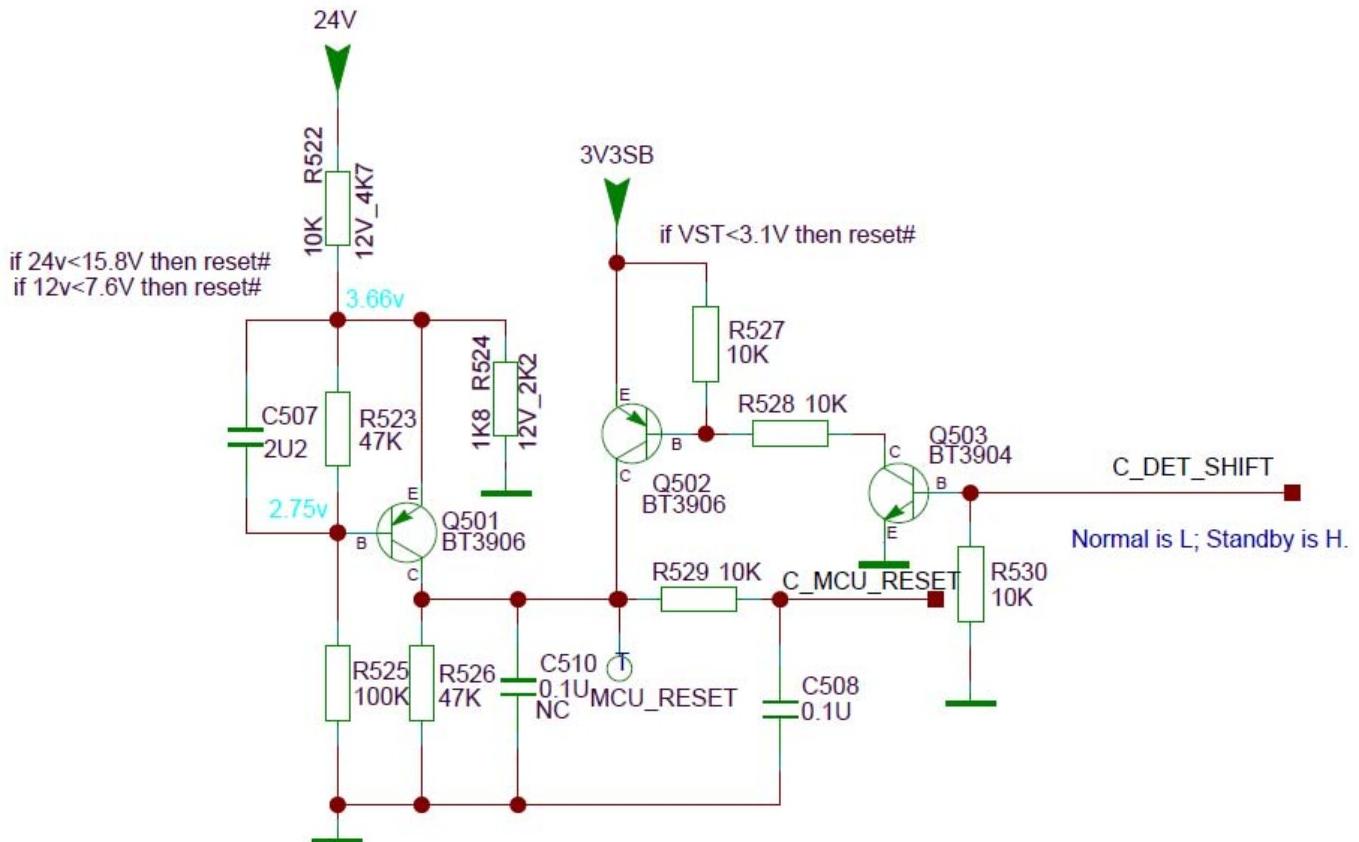
Check the Attachment 10

11.5 The DR BD PCB Layout

Check the Attachment 11

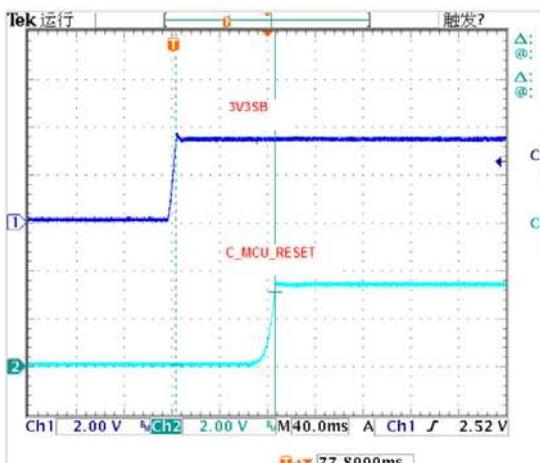
12. Key Check Point

12.1 RESET UNIT

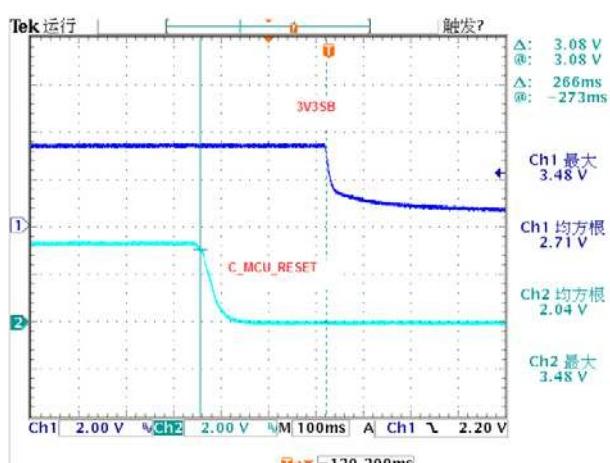


When the TV set is turned on, the waveform of **MCU_RESET** shall be PIC1.

When the TV set is turned off, the waveform of **MCU_RESET** shall be PIC2.

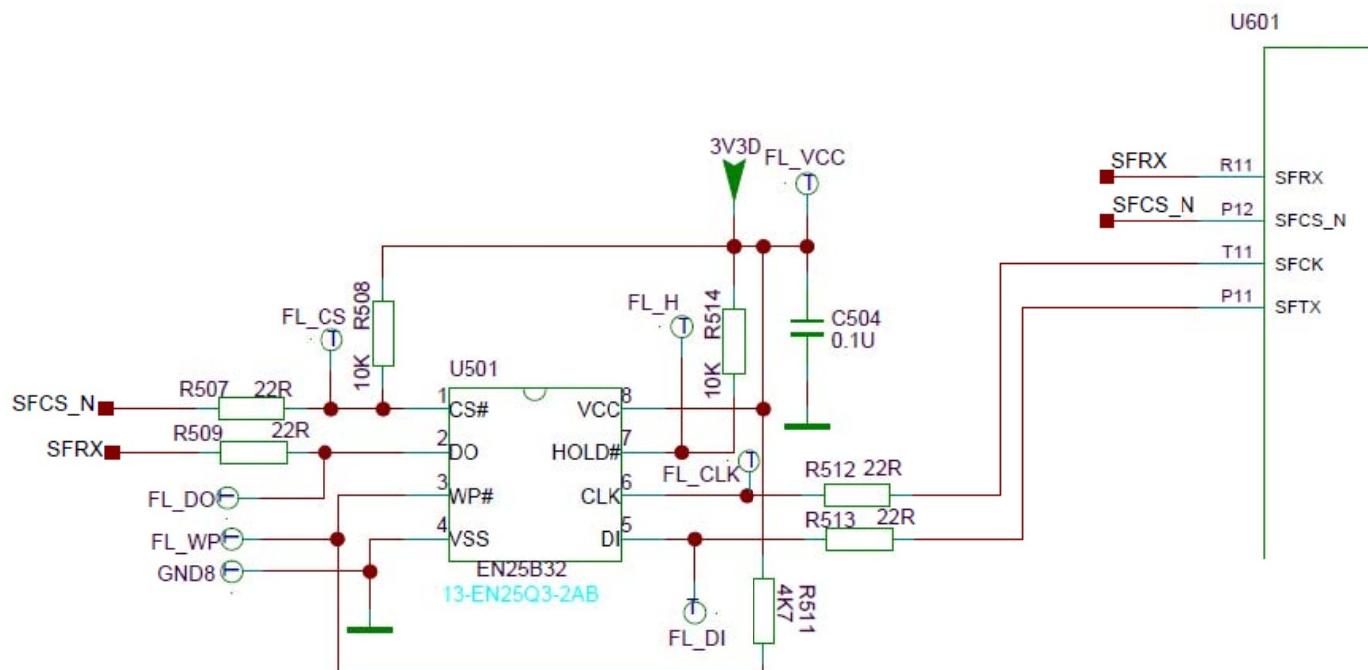


PIC1



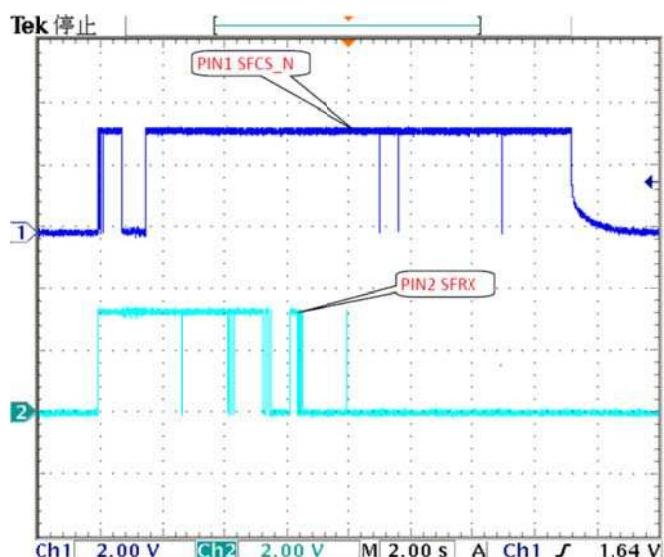
PIC2

12.2 FLASH IC UNIT



U501 PIN1&PIN2 point waveform shall be PIC1.

U501 PIN5&PIN6 point waveform shall be PIC2.

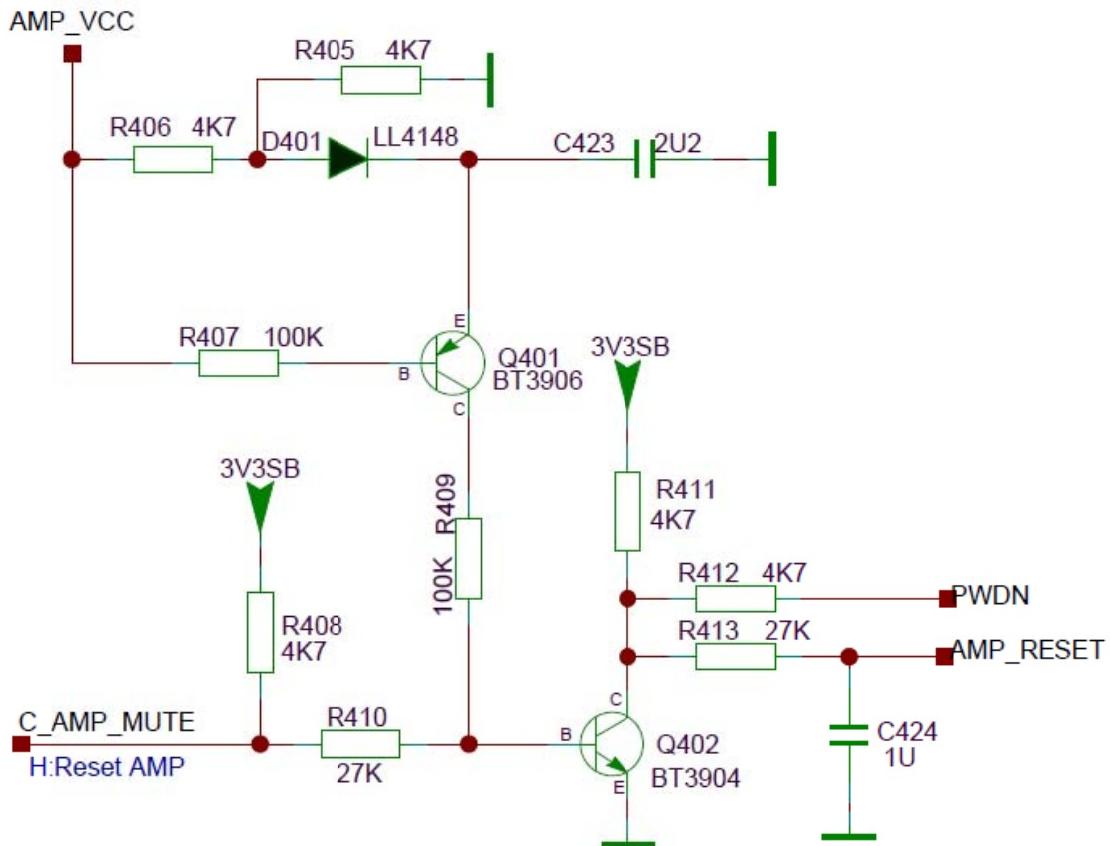


PIC1



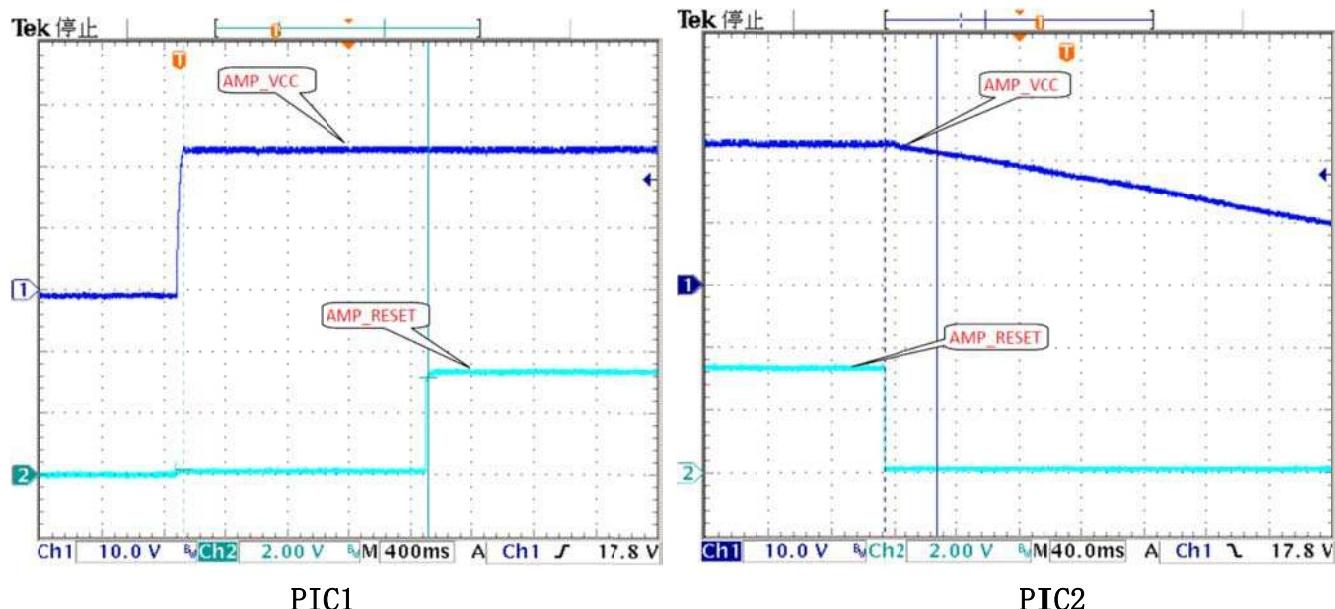
PIC2

12.3 AUDIO AMPLIFIER UNIT

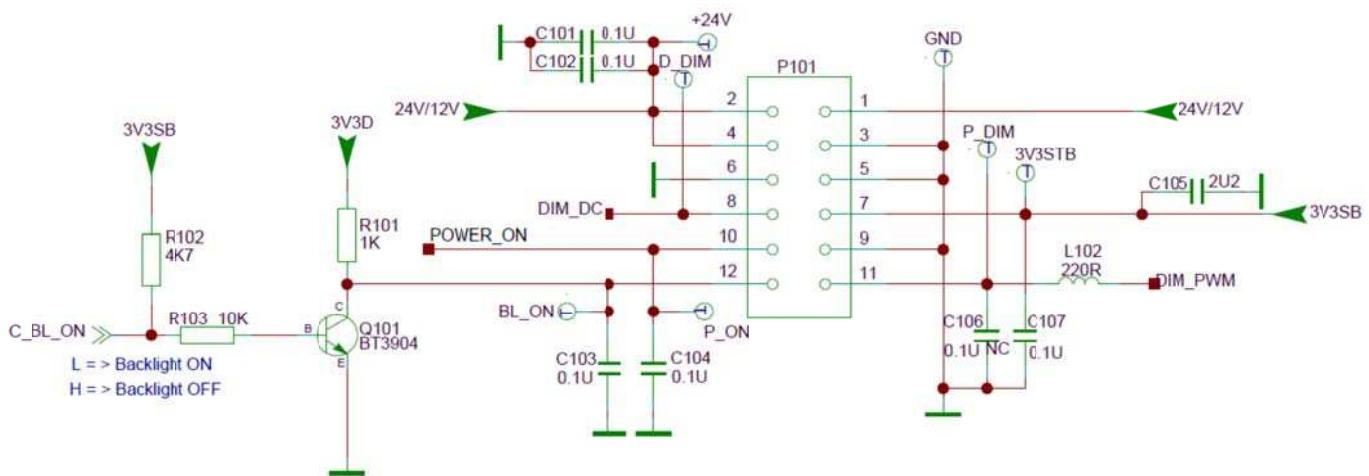


When the TV set is turned on, the waveform of **AMP_RESET** shall be PIC1.

When the TV set is turned off, the waveform of **AMP_RESET** shall be PIC2.



12.4 Power & control signal



PIN NO.	Sign	Value (turn on)	Function
1/2/4	24/12V	24V	Power supply
3/5/6/9	GND	0V	GND
7	3V3STB	3.3V	Standby power, With AC input, +3.3V is always available .
8	DIM_DC	0-3.3V	Adjust backlight
10	Power_on	3.3V	If ON/OFF signal = 0V, +24V and the other are not available. If ON/OFF signal = 3.3V, +24V and the other are available.
11	DIM_PWM	0-3.3V	Adjust backlight
12	BL_ON	3.3V	If ON/OFF signal = 0V, Backlight OFF. If ON/OFF signal = 3.3V, Backlight ON

13. BOM LIST

SERVICE BOM of FVM4012_RSC8L

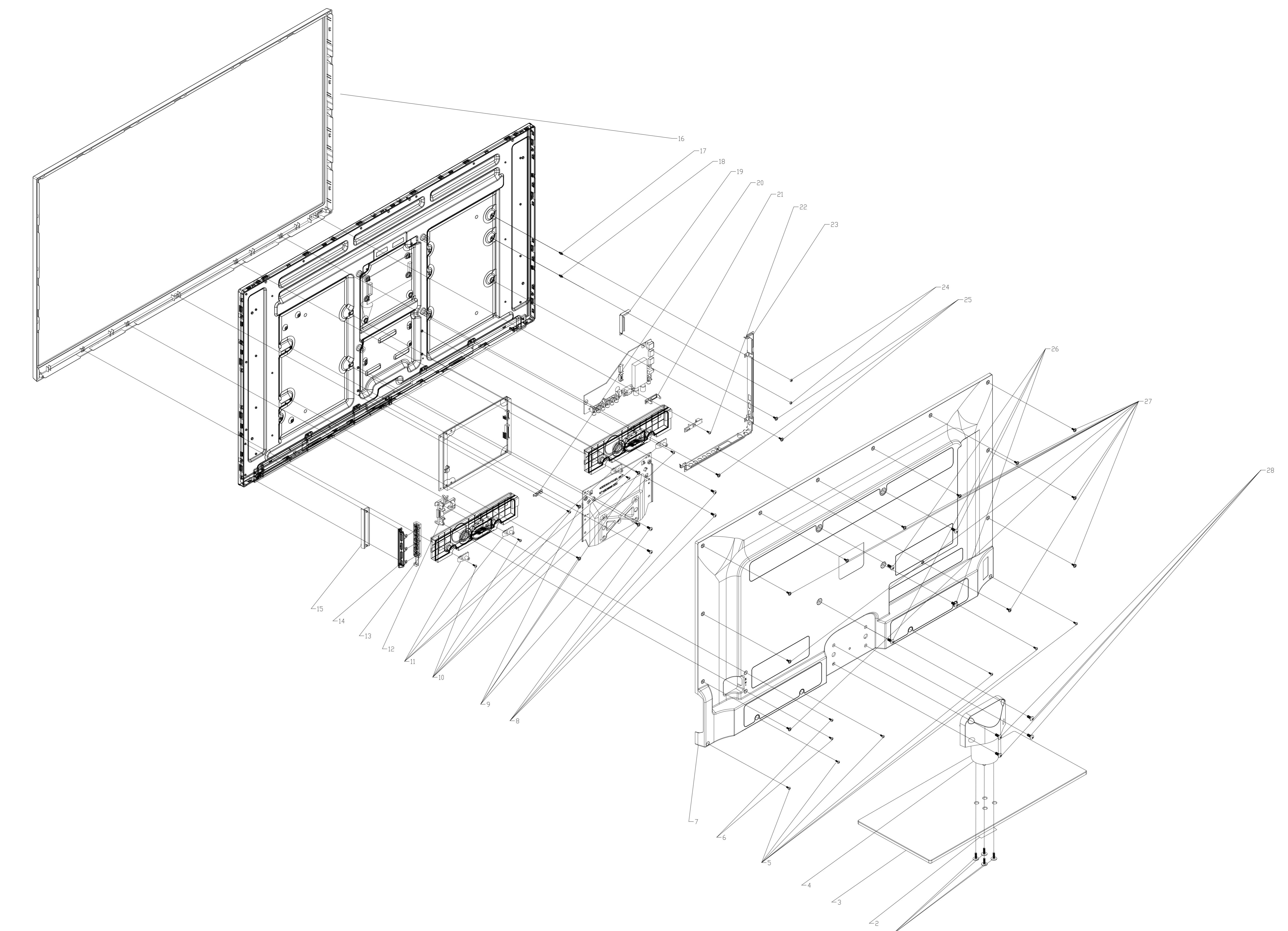
No.	ODM Partner Part	Sanyo Part Number	Category	Description	Remark	Quantity
1	51-BC0180-0DR0FG	8TL51-BC0180-	ACC	POWER CORD	POWER CORD 1800MM Y GL0804550	1
2	S8-40E53G4-RC1	8TLS8-40E53G-	COV	BACK COVER ASSY	WITH WALL MOUNT & I/O RABEL	1
3	S8-40E53G4-FC1	8TLS8-40E53GA	COV	FRONT BEZEL ASSY		1
4	S8-40E53G4-BS1	8TLS8-40E53GB	ETC	STAND ASSY	BASE, NECK, CUSHION & HOLDER (parts not assembled)	1
5	56-923370-1UK6RG	8TL56-923370-		STAND NECK	RAW STAND STAND-NECK -- 00 00 00 R=Y	1
6	67-M93898-4G0	8TL67-M93898-		STAND HOLDER	RAW SUPPORT M -- 00 00 00 R=Y	1
7	64-B50120-105G	8TL64-B50120-	ETC	STAND SCREW	Screw M5*12, Neck to back of TV	4
	63-S4015T-BT4G	8TL63-S4015T-		BASE SCREW	4 x 15, coarse thread, Base to Neck	4
8	62-961270-0UAG	8TL62-961270-	ETC	SPEAKER STAY	RAW SUPPORT SPEAKER SUPPORT -- 00 00 00	4
9	56-955060-0HH1AG	8TL56-955060-	ETC	LENZ		1
10	56-961280-0UL6RG	8TL56-961280-	ETC	BUTTOM, KEY	RAW SUPPORT KEY SUPPORT -- 00 00 00 R=N	1
11	72-E53C8L-XNA1C	8TL72-E53C8L-	ETC	OWNERS MANUAL	PRI -- IB E5300 NA SANYO -- R=Y	1
12	76-961880-0AT1A	8TL76-961880-	ETC	CARTON BOX	RAW CARTON-BOX 40FVM4012 KXKXK 00 00 00	1
13	75-963360-EC0	8TL75-963360-	ETC	PACKING (TOP - RIGHT)	RAW POLYFOAM TOP RIGHT 40FVM4012 -- 00 0	1
14	75-963350-EC0	8TL75-963350-	ETC	PACKING (TOP - LEFT)	RAW POLYFOAM TOP LEFT 40FVM4012 -- 00 00	1
15	75-963370-EC0	8TL75-963370-		PACKING (BOTTOM - middle)	RAW POLYFOAM BOTTOM 40FVM4012 -- 00 00 R	1
16	74-120080-50HSY	8TL74-120080-	ETC	PE BAG		1
17	06-530W37-S002X	8TL06-530W37-	ETC	REMOTE CONTROLLER	RCT SANYO BLACK 3V 0.304A 1UA 0	1
18	46-60FS40-CFB01G	8TL46-60FS40-	HAR	LVDS CABLE	WIRE LVDS 400MM 40-51PIN PHD PHD 2.0-1.0	1
19	46-LL035L-12X01G	8TL46-LL035L-	HAR	CABLE FOR M/B TO P/B	WIRE POWER SULLPY WIRE FOR MAIN BOARD 35	1
20	46-FM060L-07P01G	8TL46-FM060L-	HAR	CABLE FOR M/B TO IR BOARD	IR WIRE 600MM 7 A200	1

13. BOM LIST

SERVICE BOM of FVM4012_RSC8L

No.	ODM Partner Part	Sanyo Part Number	Category	Description	Remark	Quantity
21	46-FM070L-04P01G	8TL46-FM070L-	HAR	CABLE FOR M/B TO KEYPAD BOARD	WIRE KEY WIRE 700MM 4PIN PH(LOCK) GH 2.0	1
22	46-CV010L-02J01G	8TL46-CV010L-	HAR	SPEAKER CABLE (L)	WIRE SPEAKER WIRE 100MM 2PIN TJC3(LOCK) WHITE COLOR CONNECTOR	1
23	46-BV020L-02J01G	8TL46-BV020L-	HAR	SPEAKER CABLE (R)	WIRE SPEAKER WIRE 200MM 2PIN TJC3(LOCK) RED COLOR CONNECTOR	1
24	46-FL015L-28WN1G	8TL46-FL015L-	HAR	CABLE FOR DRIVER BOARD TO POWER BD.	WIRE LINE 150MM 12PIN PHD(LOCK) PH(LOCK)	1
25	46-DF110L-10X01G	8TL46-DF110L-	HAR	CABLE FOR LIGHT BAR TO DRIVER BOARD	WIRE LB LINE 1100+1100MM 6PIN A2004 A10	1
26	42-WDF720-XX2G	8TL42-WDF720-		SPEAKER	SPEAKER 16OHM 8W 78 100HZ RECTANGLE 22MM	2
27	71-NASA42-EGY1B	8TL71-NASA42-	LAB	RATING LABEL	PRI LABEL FVM4012/RSC8L R=Y	1
28	4A-LCD40O-SS1	8TL4A-LCD40O-	LCD	LCD PANEL	40INCH 60HZ FHD LSC400HM01 OPENCCELL	1
29	08-40E5301-IR300AA	8TL08-40E530-	PCB	IR BOARD		1
30	08-PE371H4-PW200AA	8TL08-PE371H-	PCB	POWER BOARD		1
31	08-RSC8L13-MA200AA	8TL08-RSC8L1-	PCB	MAIN BOARD		1
32	08-32E5308-KE200AA	8TL08-32E530-	PCB	KEYPAD BOARD		1
33	AC CORD ADAPTER				Is between AC Cord and Pwr Bd.	1
34	PLASTIC SPACER				Plastic piece between Key Button & panel	1
35	08-RT421C2-DR200AA	8TL08-RT421C-		PANEL DRIVER BOARD	PANEL DRIVER BOARD	1

Attachment 1-1



Technical requirement:

1) Supplier to conduct Cpk measurements on the following:

A) Dimensions in

B) Weight of raw part= XXX±1%

(based on pro-e data to be review after MR)

C) Warpage dimension as specified in the drawing.

2) Cpk measurements to be submitted at Mass Production;

3) Material: XXXXX

4) High Gloss product: High Gloss min 80%;

5) Appearance surface to be free of flow lines,

sink marks and other moulding issue.

Process requirement:

1) CTQ measure samples for Cpk = 30 PCS, CTQ dimension samples = 5 PCS;

2) Cpk measurements to be submitted at FOT, SOT, TOT, Mold release and Local MR;

3) Require High Gloss Appearance for FOT sample.

No.	TOL number	name	Position	4	Plastic neck to module
28	64-B50120-105G	Screw	BC to module	4	Plastic neck to module
27	64-W30060-105G	Screw	VC to screen	4	VC to screen
26	64-B60120-104G	Screw	VC to screen	4	VC to screen
25	64-B60120-104G	Screw	VC to screen	4	VC to screen
24	65-Y30150-23MG	NUT-HEXAGON	PCB to module	4	PCB to module
23	64-B30200-1000A	AV support	PCB to module	4	PCB to module
22	64-B30200-1000A	AV support	PCB to module	4	PCB to module
21	56-955160-0HHA	Lens	Lens PCB to FC	4	Lens PCB to FC
20	64-M04935-SC00	Holder	Module to FC	4	Module to FC
19	64-M04935-SC00	Holder	PCB to module	4	PCB to module
18	66-891270-8E	Hole	PCB support to module	4	PCB support to module
17	66-891270-8E	Hole	AV support to module	4	AV support to module
16	56-951280-0U16K	Holder	Key to module	4	Key to module
15	56-951280-0U16K	Support	Key support	4	Key support
14	56-951280-0U16K	Support	Key support	4	Key support
13	56-951280-0U16K	Support	Key support	4	Key support
12	66-914650-0U16	AC support	AC support	4	AC support
11	66-914650-0U16	AC support	AC support	4	AC support
10	64-B30060-B14G	Screw	Speaker support to module	5	Speaker support to module
9	64-B30060-104G	Screw	Power to module	4	Power to module
8	64-B30060-104G	Screw	Power to module	4	Power to module
7	66-95050-1U16K	BC	BC to AC support	2	BC to AC support
6	64-W30120-BFSG	Screw	BC to AC support	2	BC to AC support
5	56-921370-1U16K	Neck	BC to FC	6	BC to FC
4	56-921370-1U16K	Neck	BC to FC	6	BC to FC
3	05-964030-00001	Glossacter	Gloss to plastic neck	1	Gloss to plastic neck
2	64-S40151-B14G	Screw	Gloss to plastic neck	4	Gloss to plastic neck
1	64-S40151-B14G	Screw	Gloss to plastic neck	4	Gloss to plastic neck

Designator	None	Project	None
Part Name	Exploded Drawing	Model	None
Part Number		Design	None
Check		Material	None
Approve		Scale	None
Weight		Sheet	None

Technical requirement:

1) Supplier to conduct Cpk measurements on the following:

A) Dimensions in

B) Weight of raw part= XXX~~±1%~~

(based on pro-e data. to be review after MR)

C) Warpage dimension as specified in the drawing.

2) Cpk measurements to be submitted at Mass Production:

3) Material: XXXXX~~X~~

4) High Gloss product: High Gloss min 80%;

5) Appearance surface to be free of flow lines,
sink marks and other moulding issue.

Process requirement:

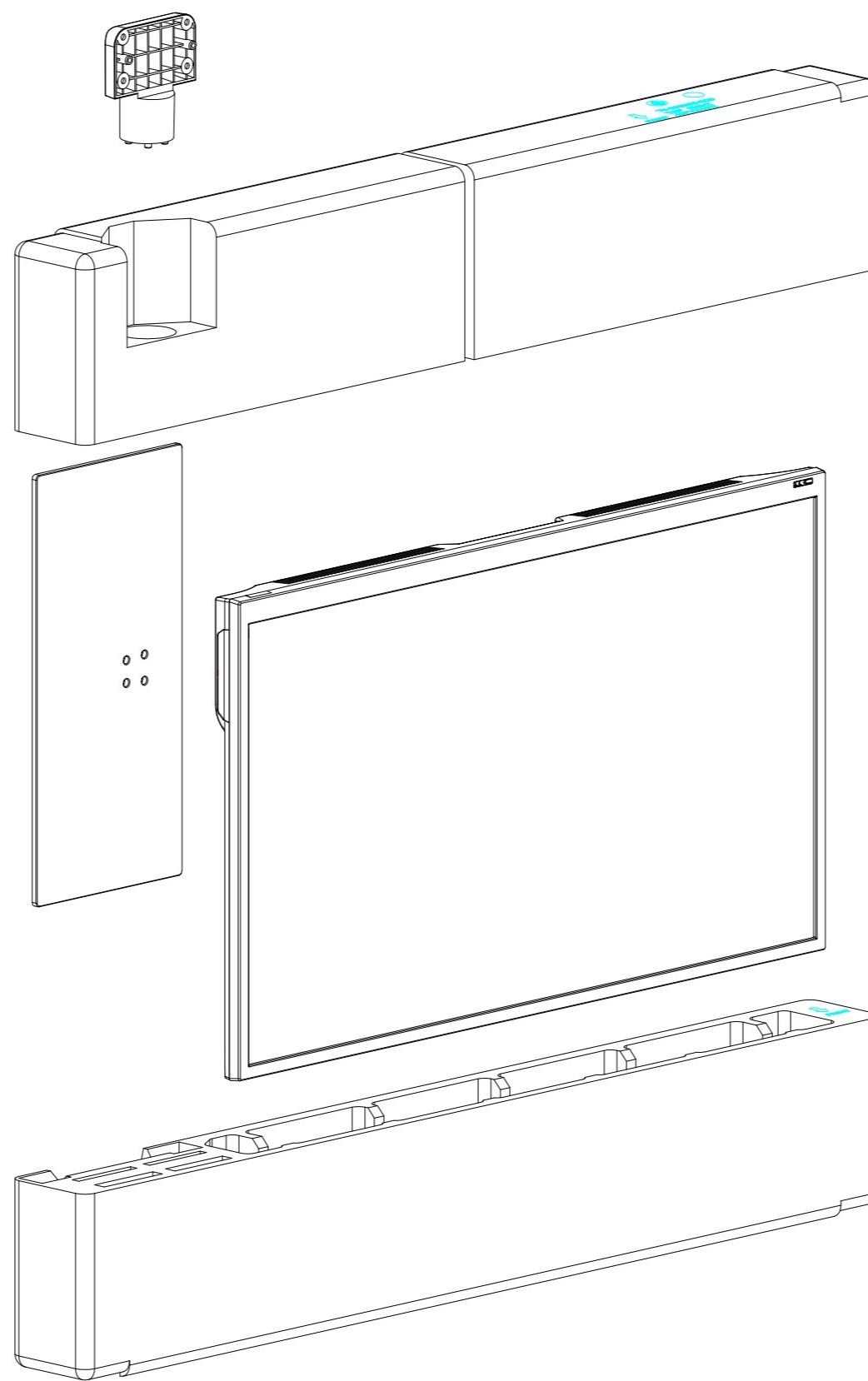
1) CTQ measure samples for Cpk = 30 PCS, CTQ dimension samples = 5 PCS;

2) Cpk measurements to be submitted at FOT, SOT, TOT, Mold release and Local MR;

3) Require High Gloss Appearance for FOT sample.

No.	TCL number	name	Position	other										
Dimension tolerance unless otherwise stated for plastic molded.	>140~160 ±0.25	>160~180 ±0.27	>180~200 ±0.30	>200~225 ±0.33	>225~250 ±0.36	>250~280 ±0.38	>280~315 ±0.42	>315~355 ±0.46	>355~400 ±0.50	>400~450 ±0.55	>450~500 ±0.60	>500~630 ±0.70	>630~800 ±0.85	>800 ±1.05
	>0~3 ±0.05	>3~6 ±0.06	>6~10 ±0.07	>10~14 ±0.08	>14~18 ±0.09	>18~24 ±0.10	>24~30 ±0.11	>30~40 ±0.12	>40~50 ±0.13	>50~65 ±0.15	>65~80 ±0.17	>80~100 ±0.19	>100~120 ±0.21	>120~140 ±0.23

Attachment 1-2



Attachment 2

Renesas RSC8L TCL DESIGN

PAGE1 INDEX

PAGE2 POWER SUPPLY INTERFACE AND CIRCUIT

PAGE3 USB UART KEY&IR INTERFACE AND CIRCUIT

PAGE4 HDMI YPbPr INTERFACE AND CIRCUIT

PAGE5 HP&LINE AUDIO OUT AV IN INTERFACE AND CIRCUIT

PAGE6 VGA&TUNER INTERFACE AND CIRCUIT

PAGE7 AUDIO AMPLIFIER&TUNER INTERFACE AND CIRCUIT

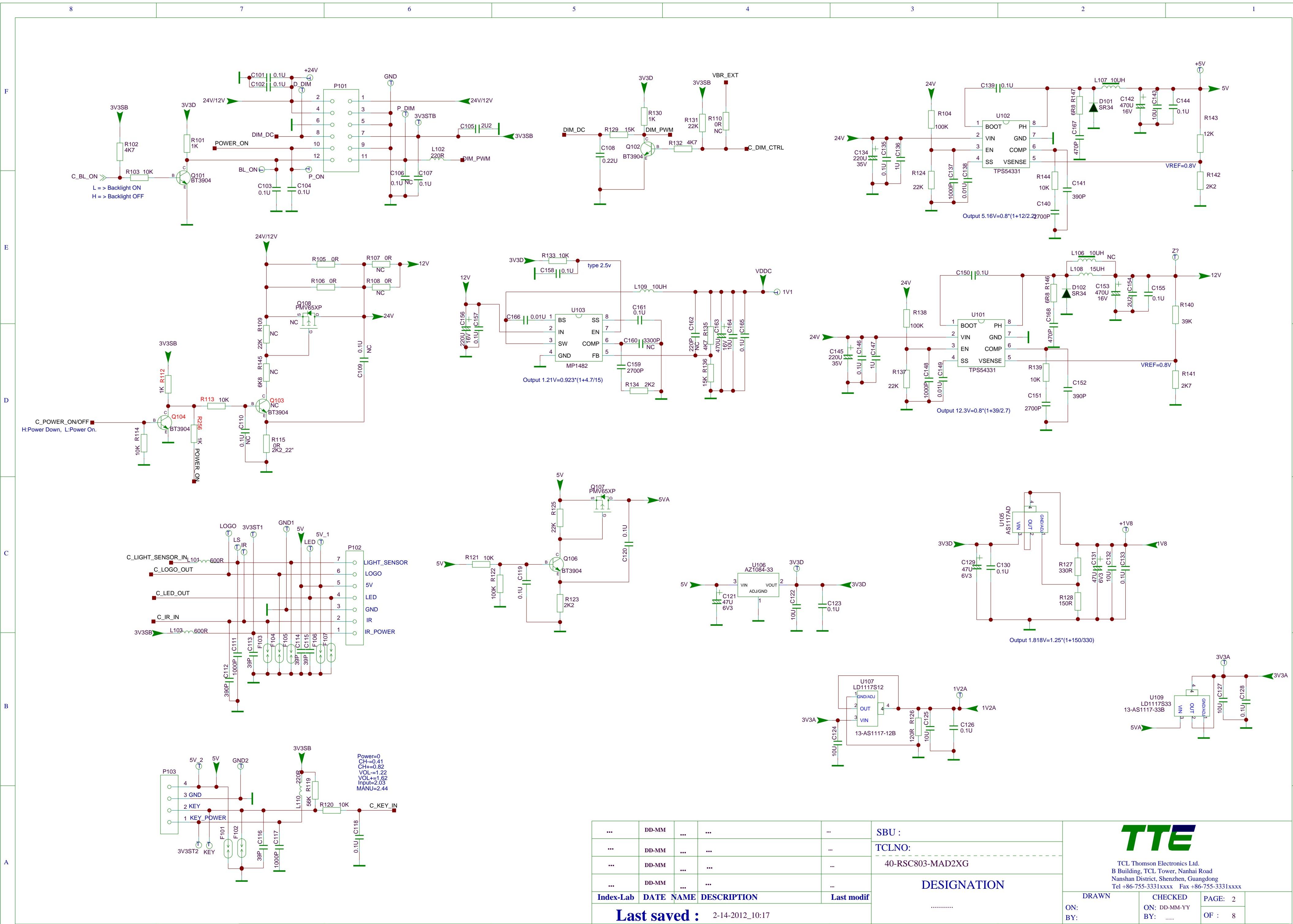
PAGE8 C8-1

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...	DD-MM	DESIGNATION
Index-Lab	DATE	NAME	DESCRIPTION	Last modif
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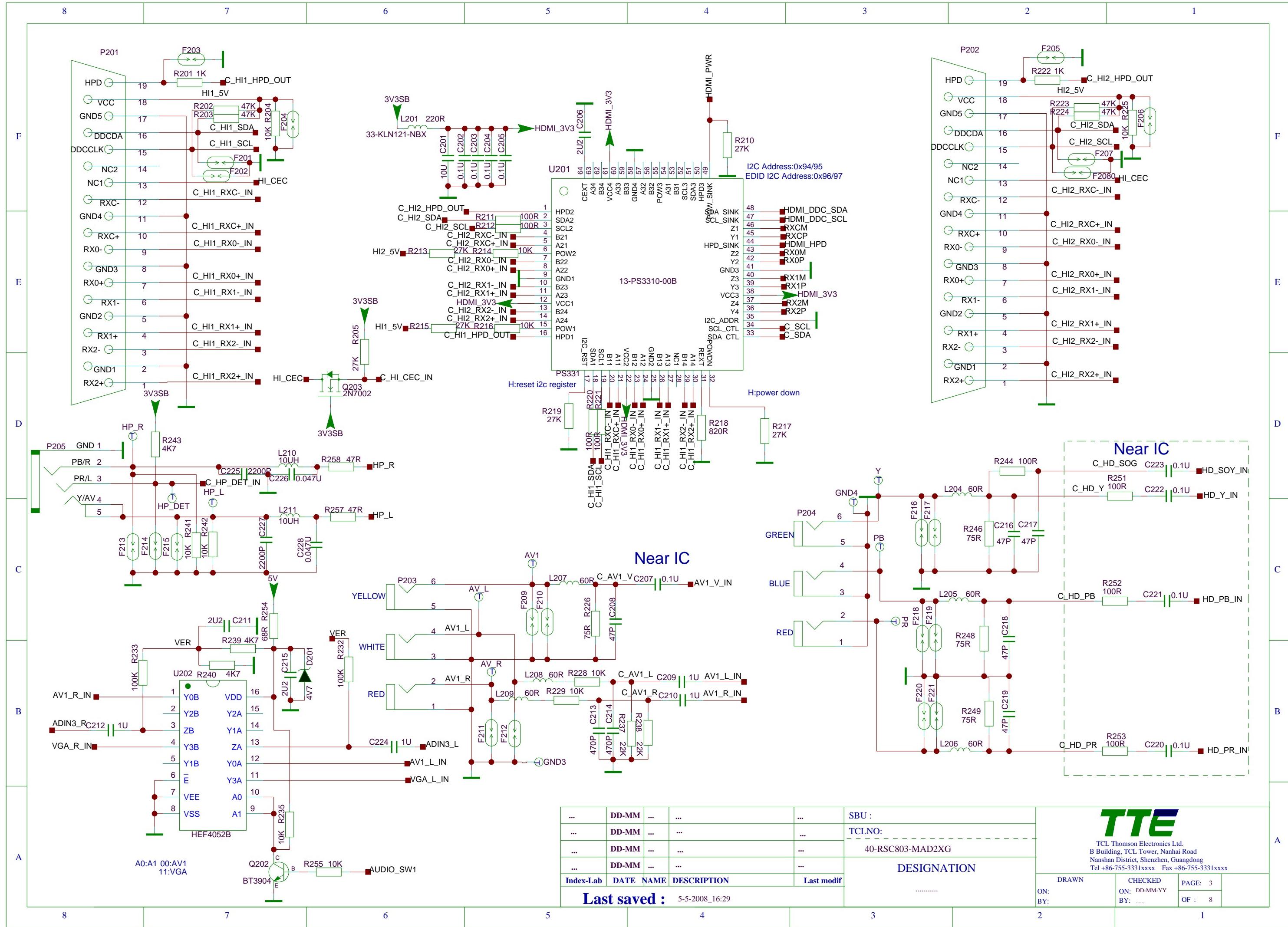


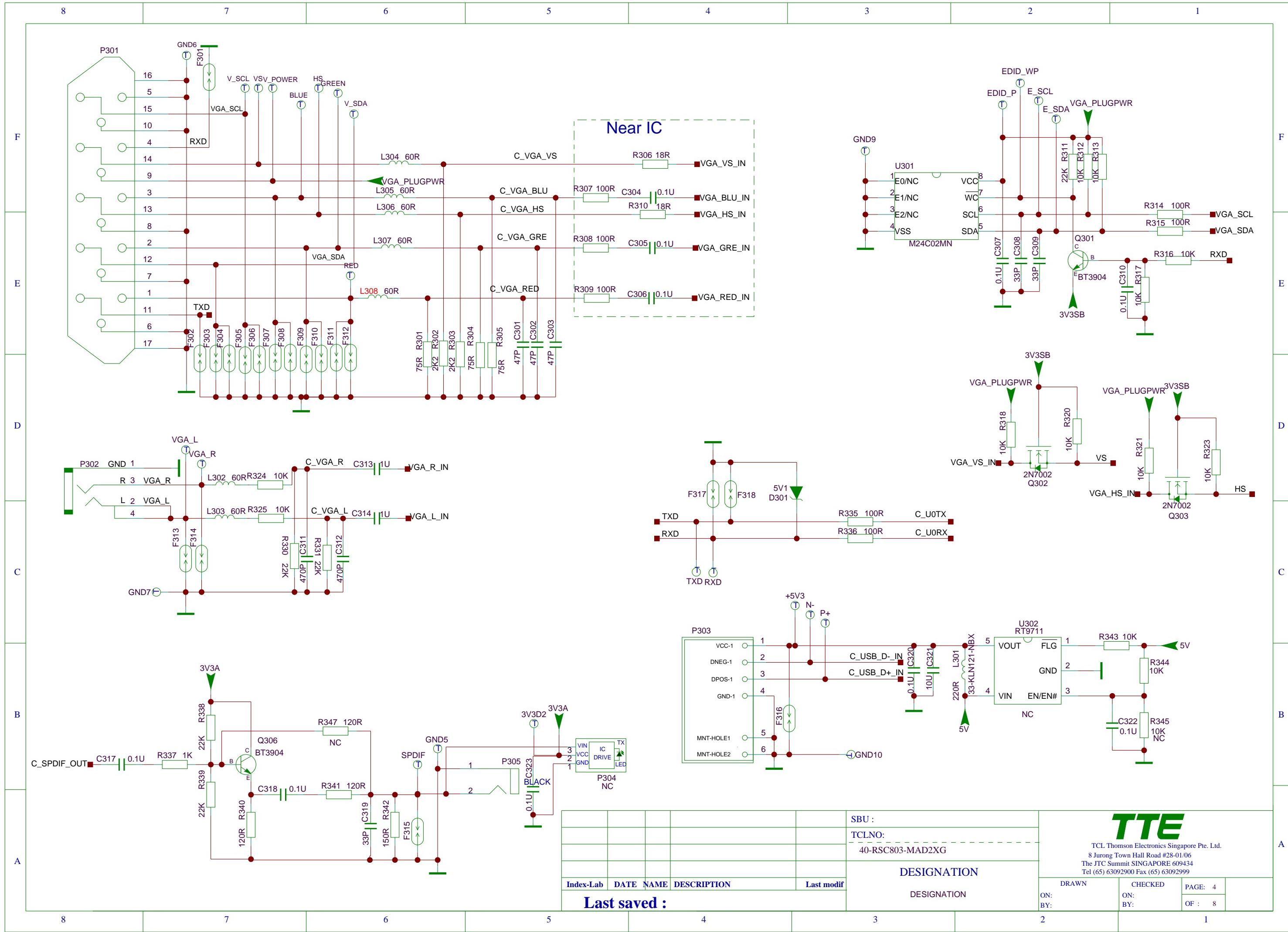
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B Building, TCL Tower, Nanhai Road
Nanshan District, Shenzhen, Guangdong

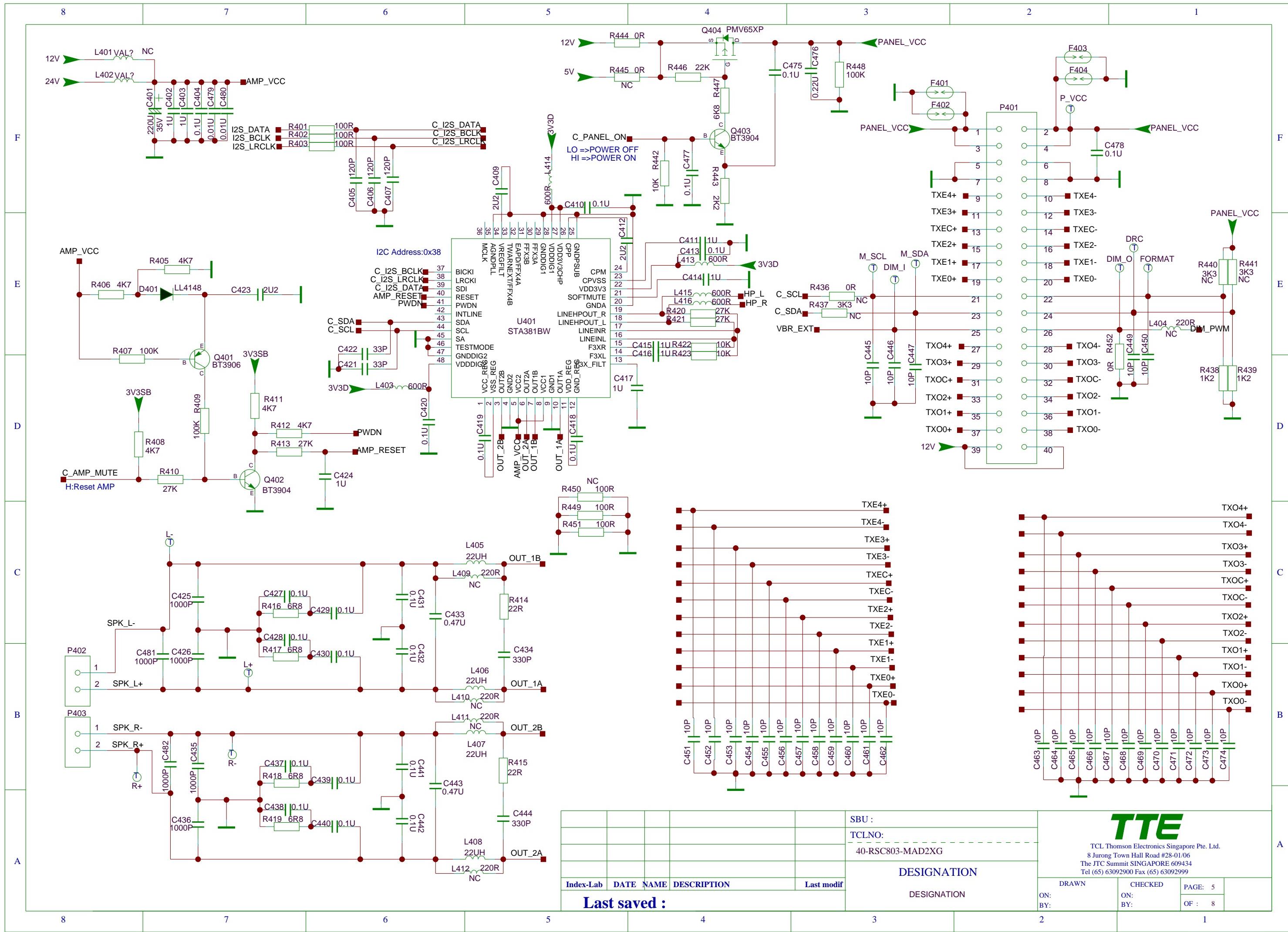
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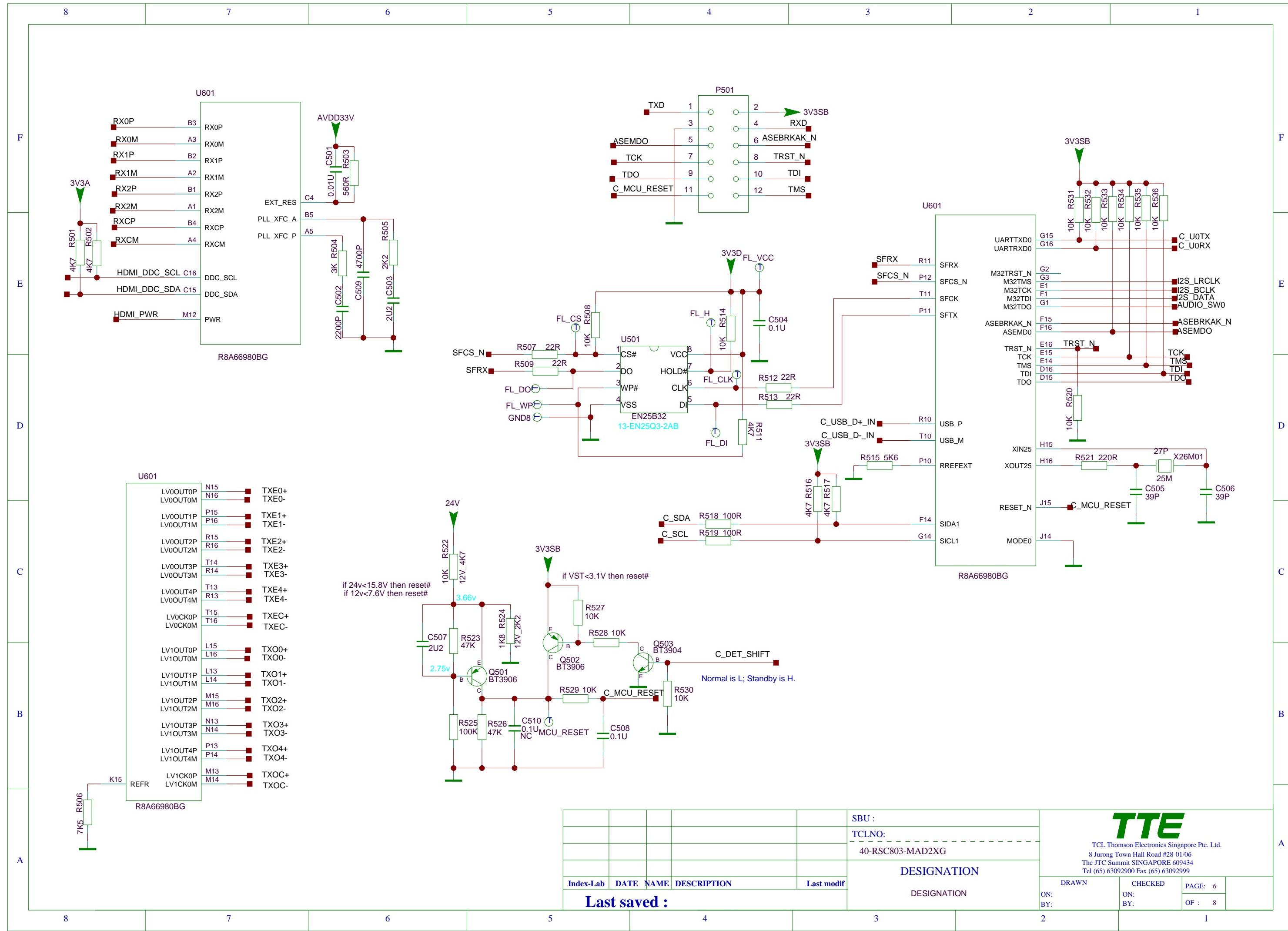


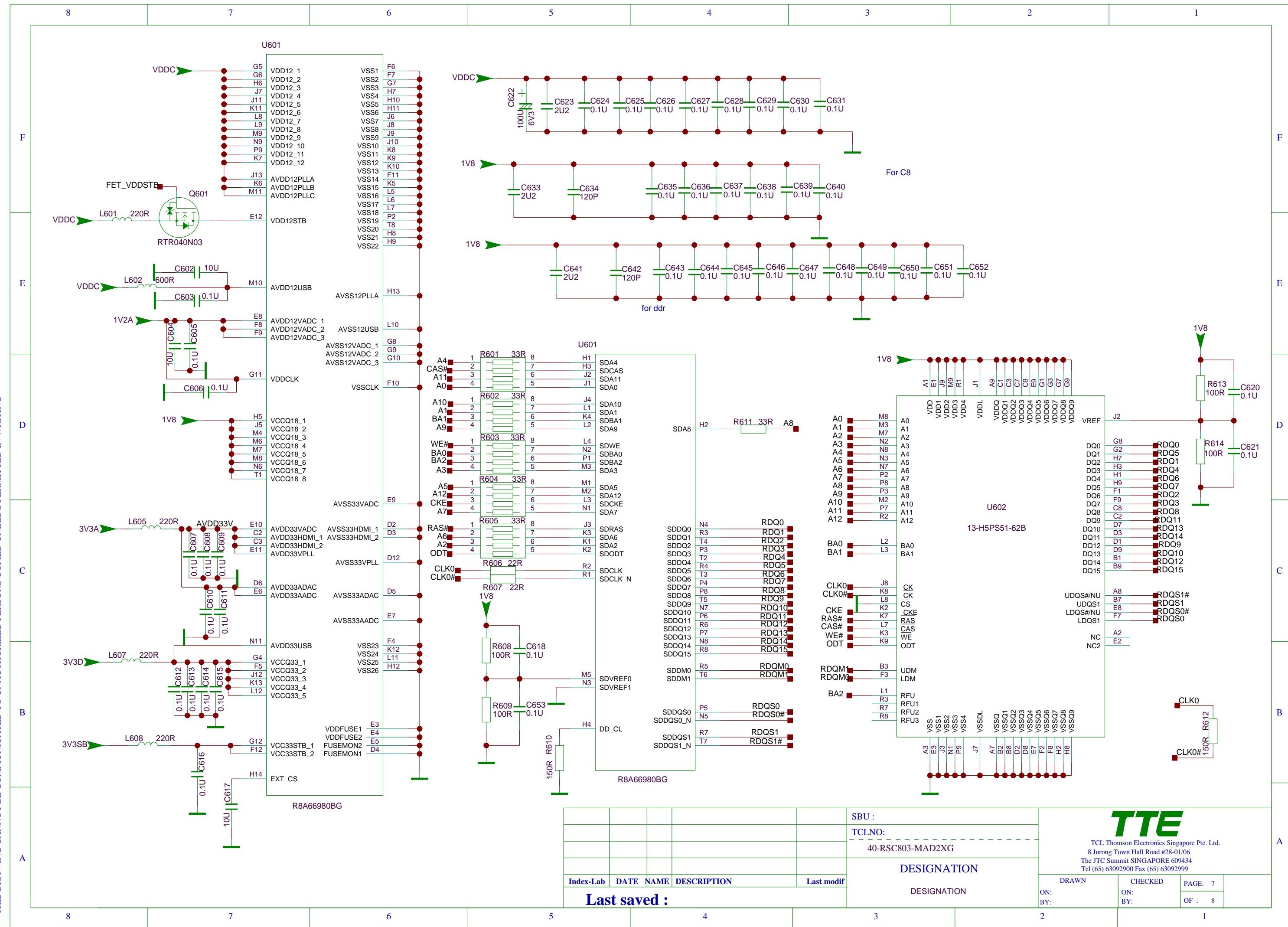
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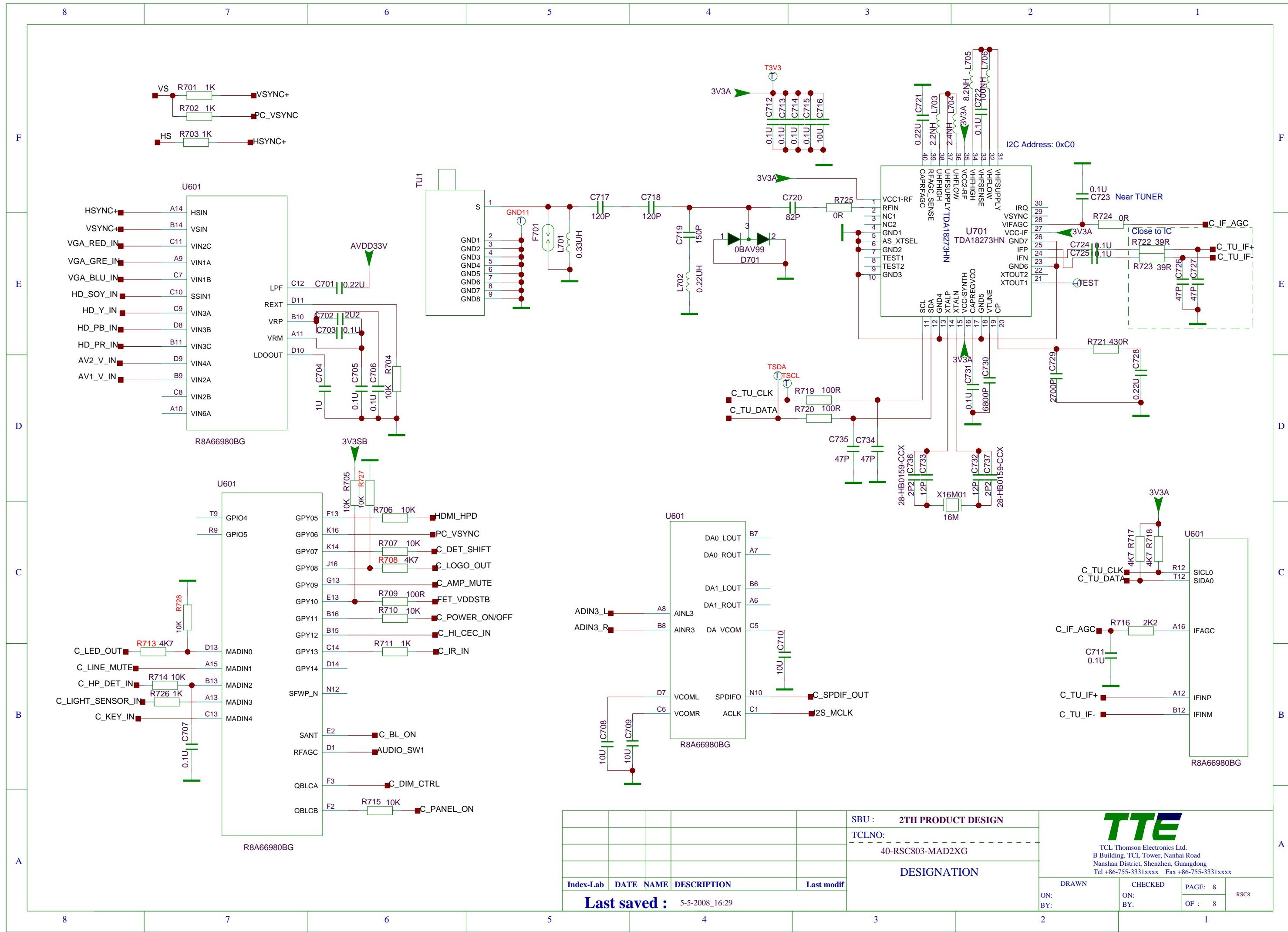




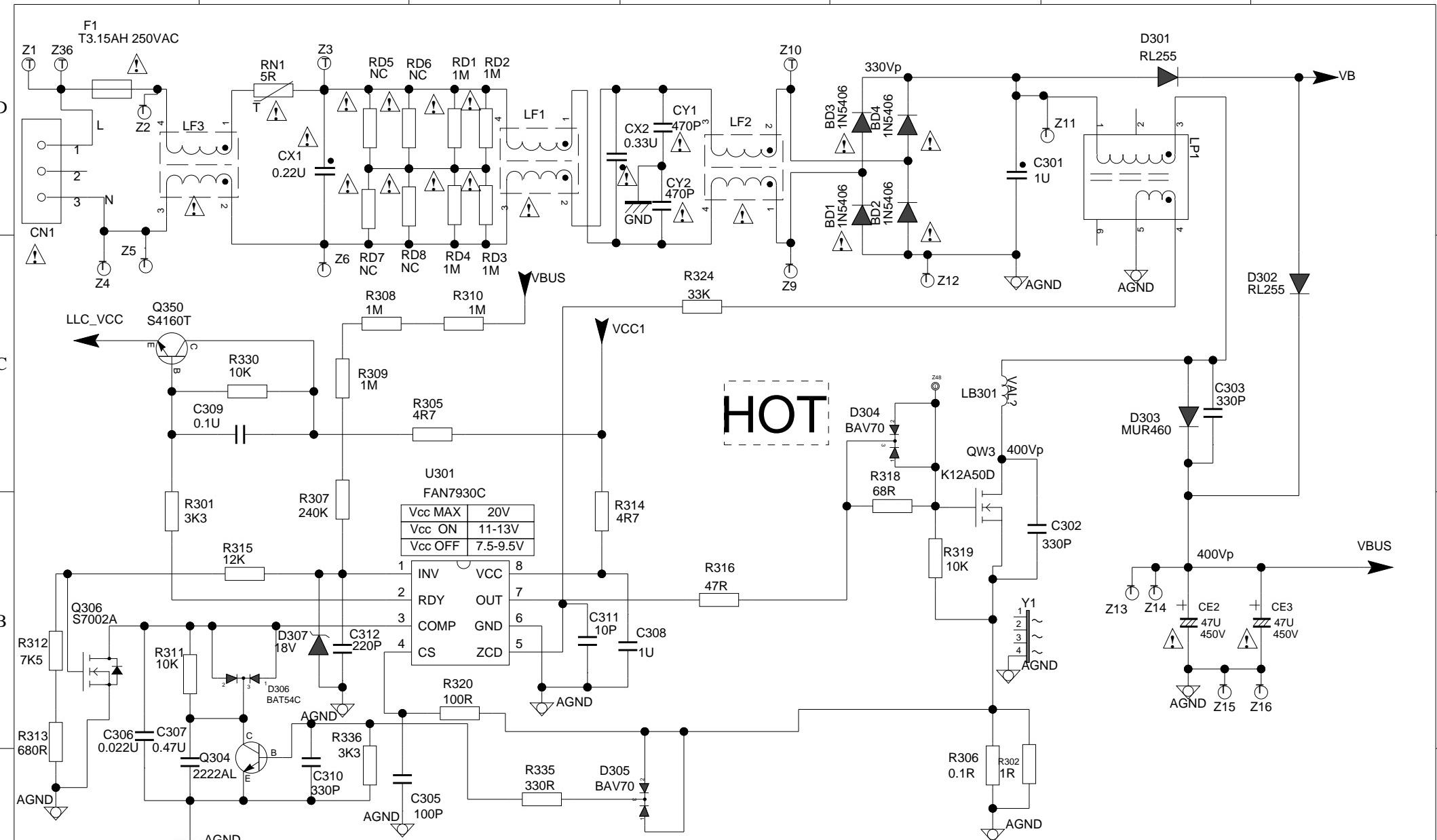




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7 6 5 4 3 2 1



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TCLNO:	
40-E371C4-PWA1XG	
DESIGNATION	
PE371C4	

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TCL

Attachment 3

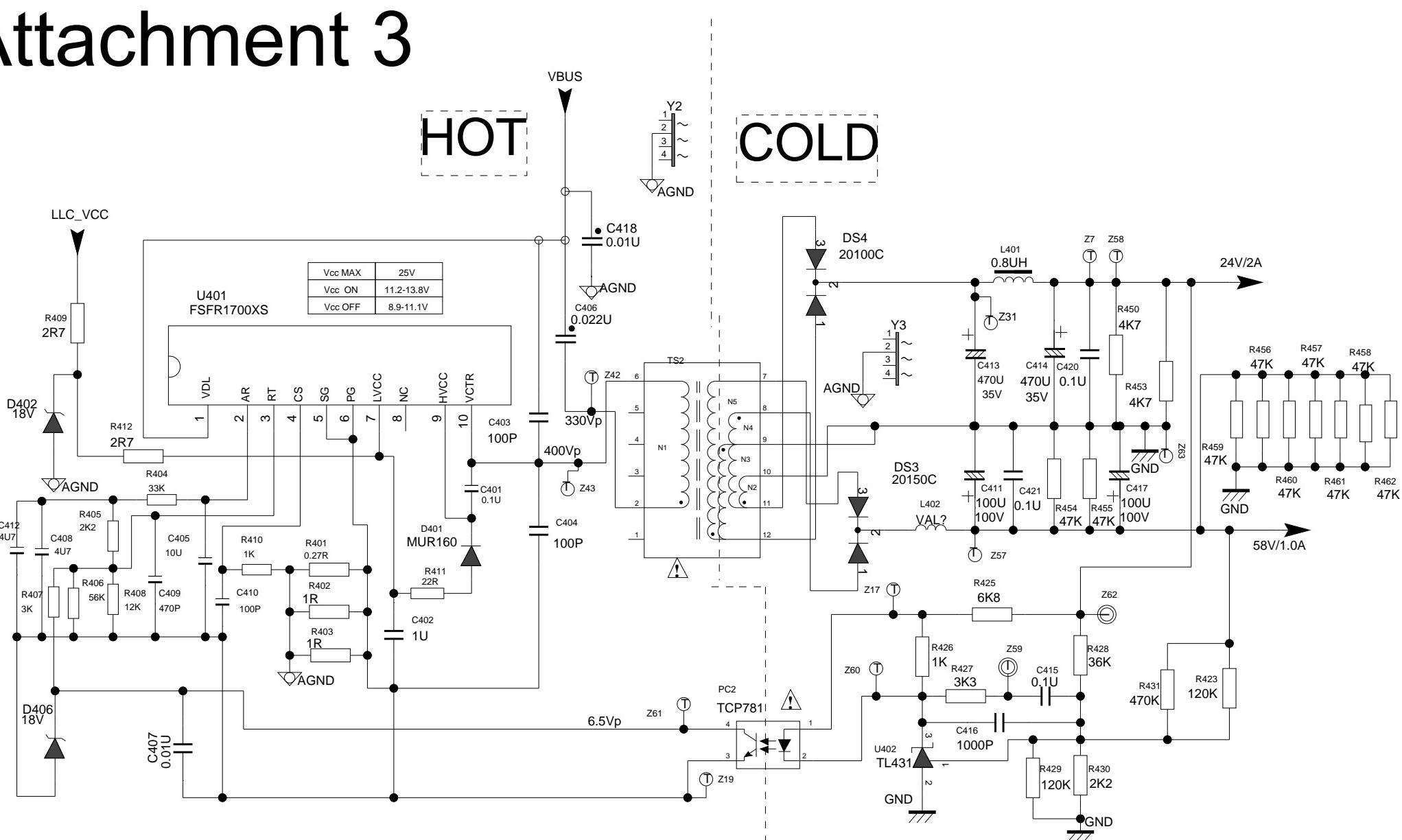
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D

C

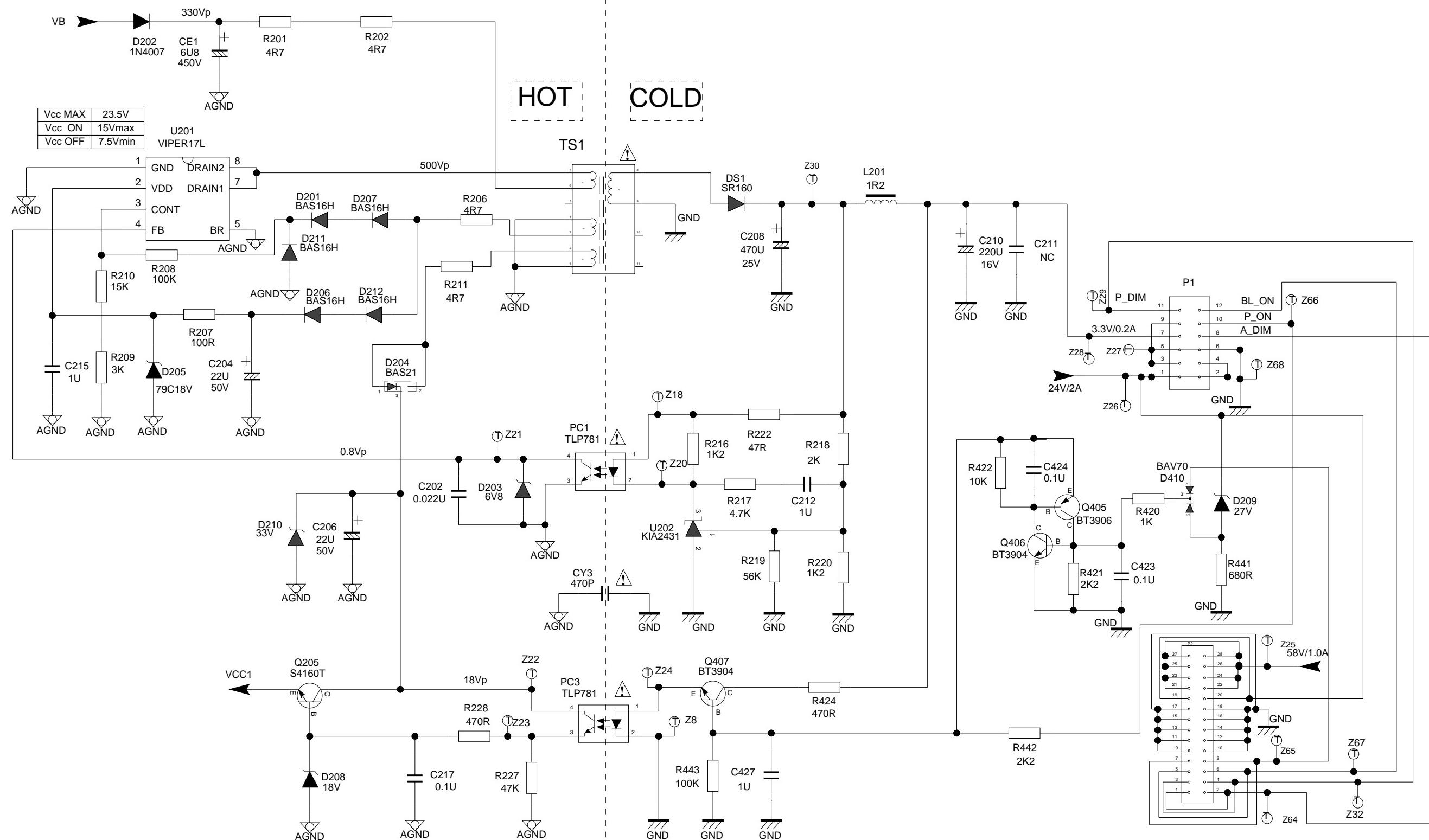
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A



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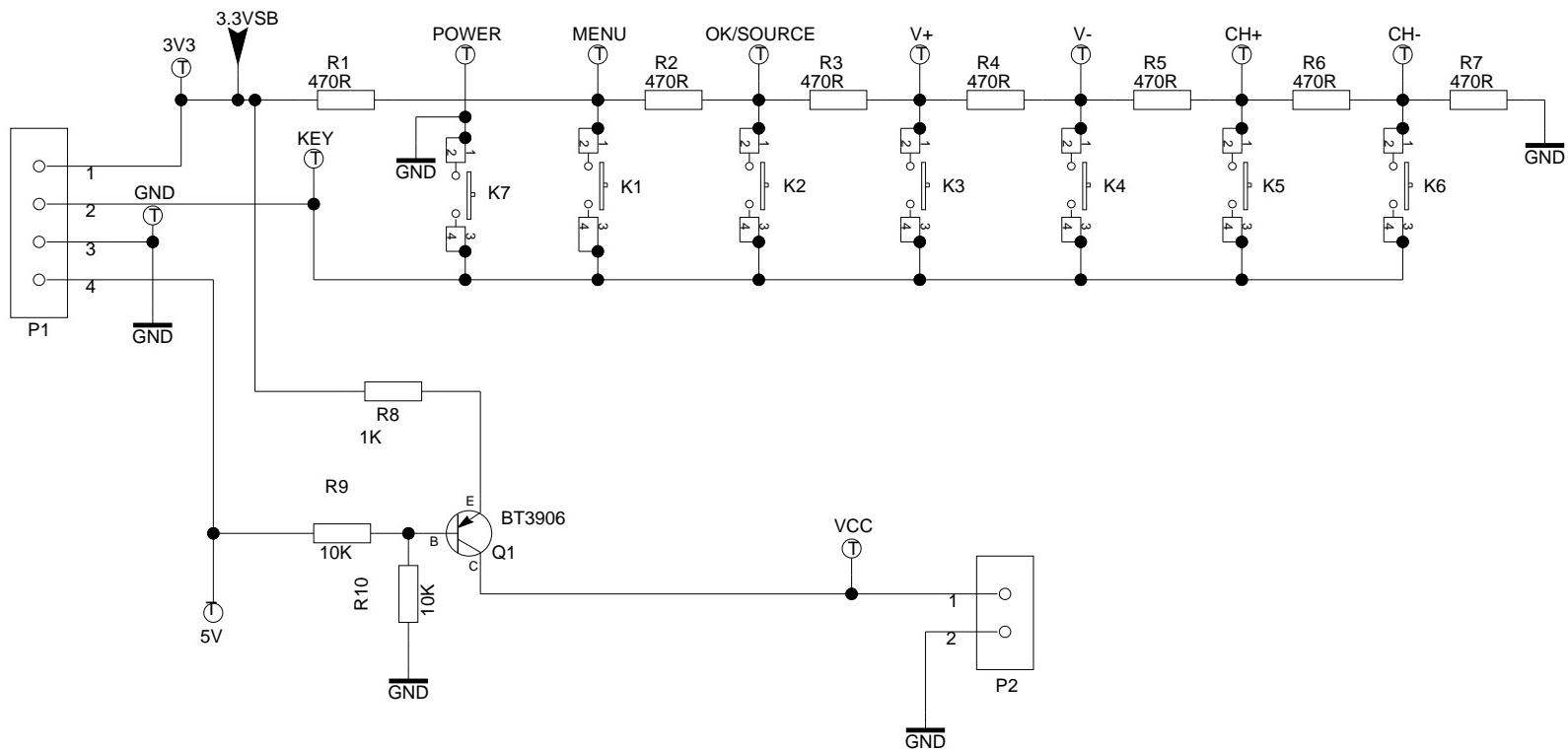


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Attachment 4

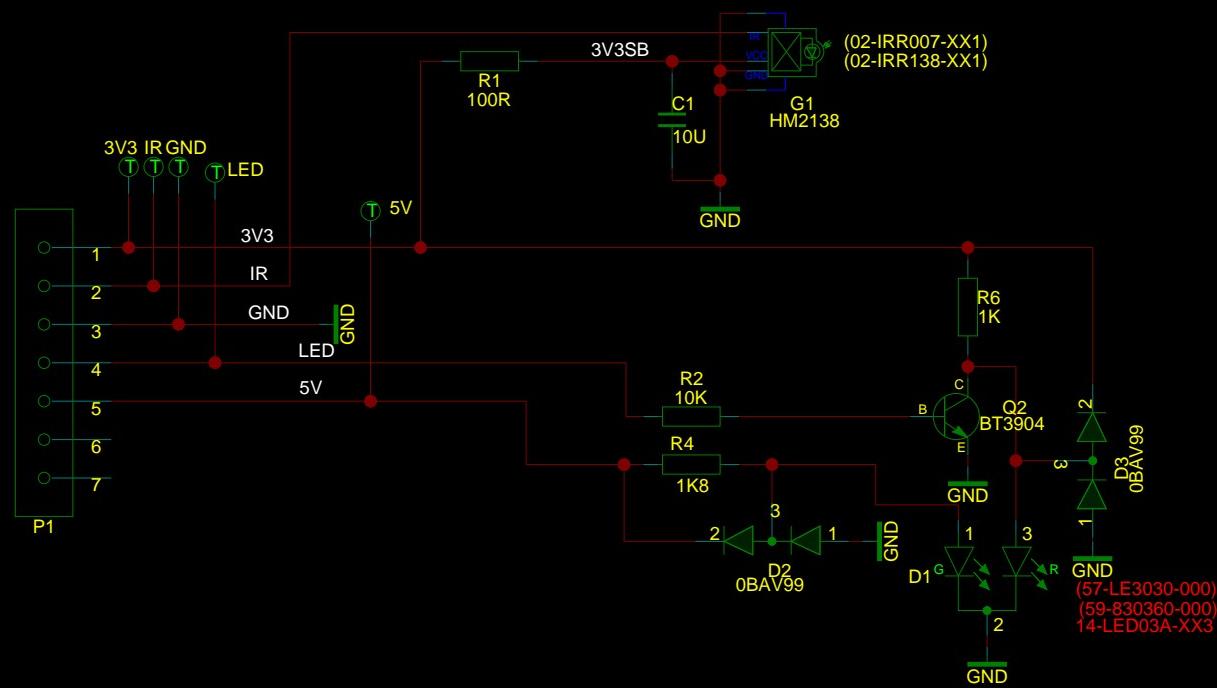
Standard circuit three

key

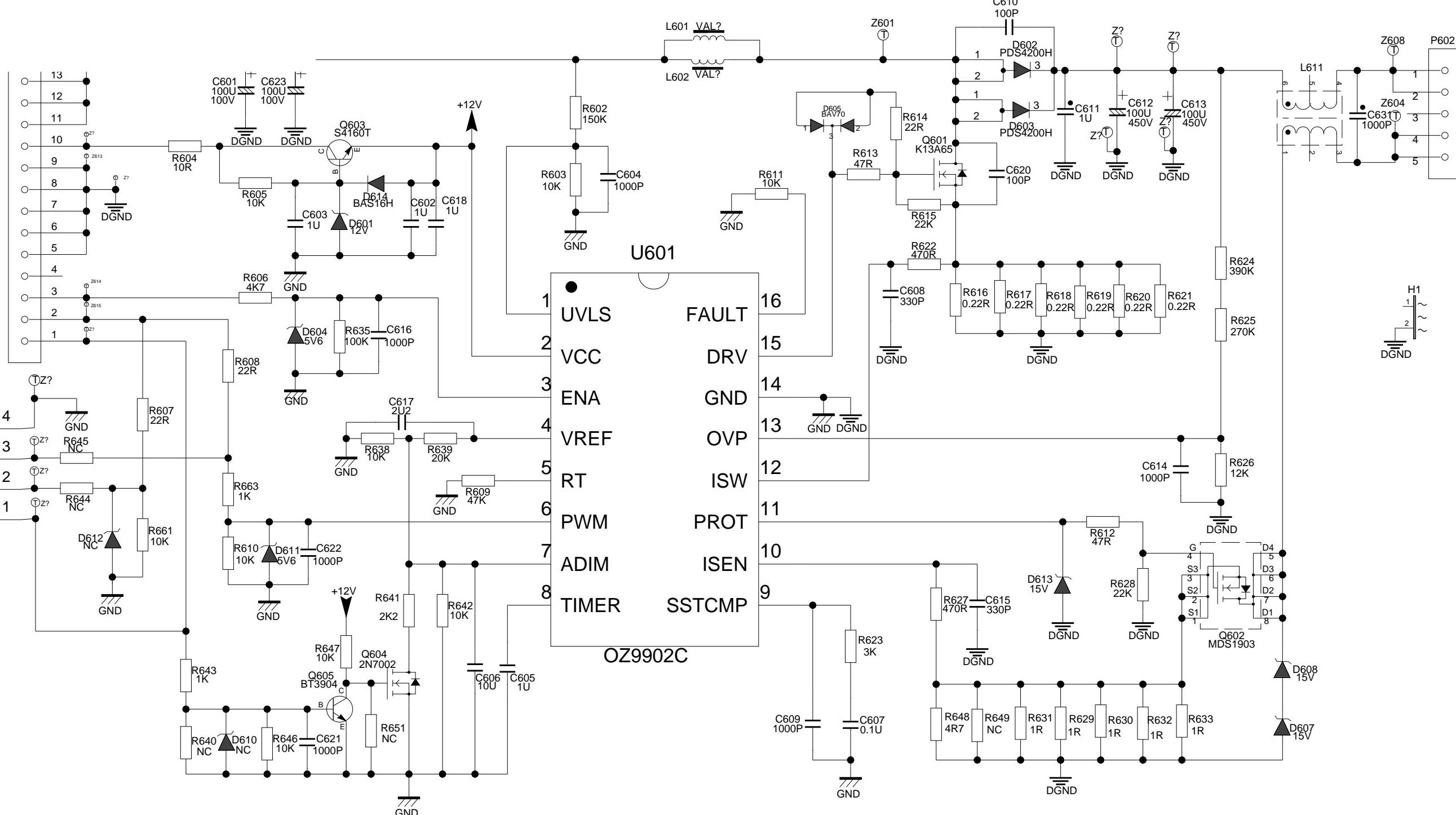


Attachment 5

40-T32CN1-IRA2XG



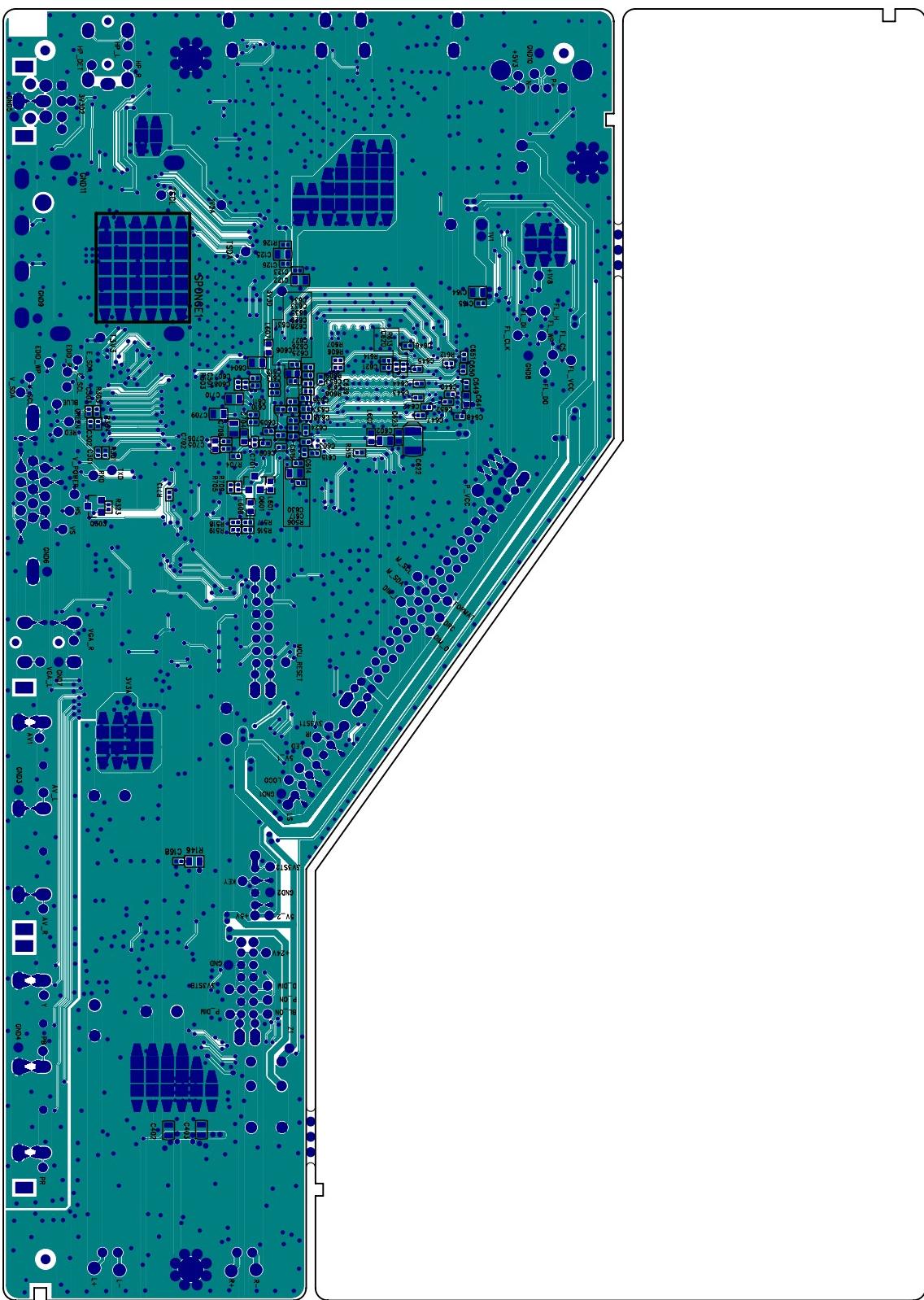
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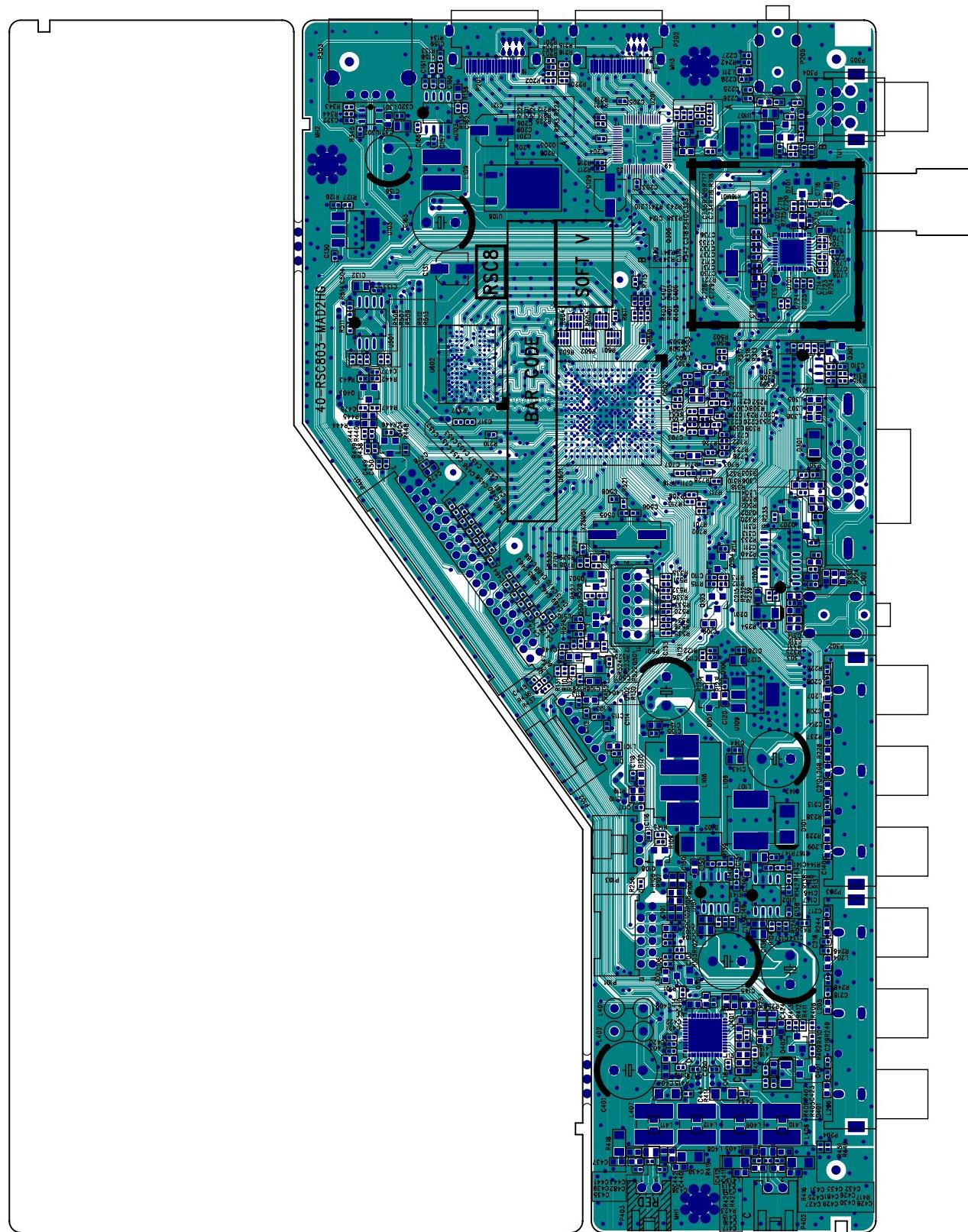
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Attachment 7

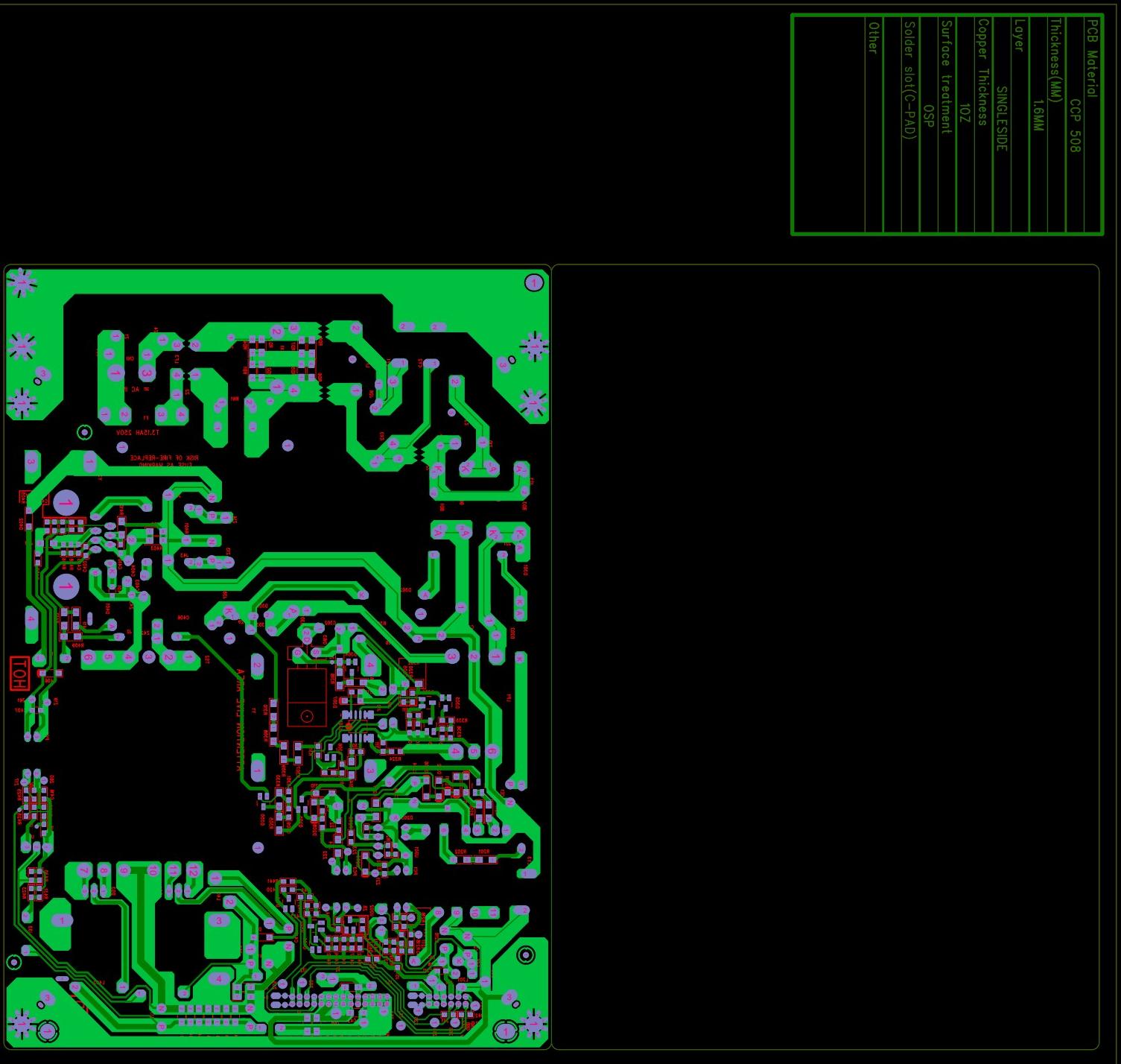


Orien	Solide	Copper	PCB Material
02b	Surface treatment	10	FR-4
Solide slot(C-pAD)	02b	Thickness (MM)	Litheness (MM)
Orien	Doubleside	J-Me	J-Me

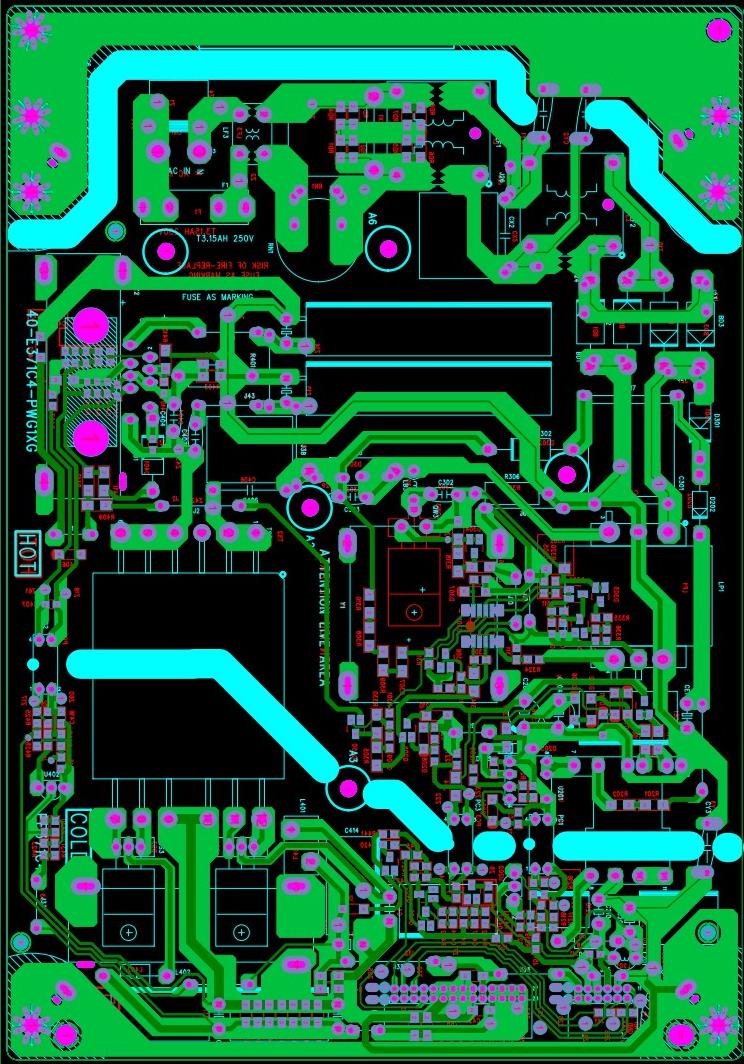


PCB Material	FR-4
Thickness(MM)	1.6MM
Layer	DOUBLESIDE
Copper Thickness	10Z
Surface treatment	OSP
Solder slot(C-PAD)	
Other	

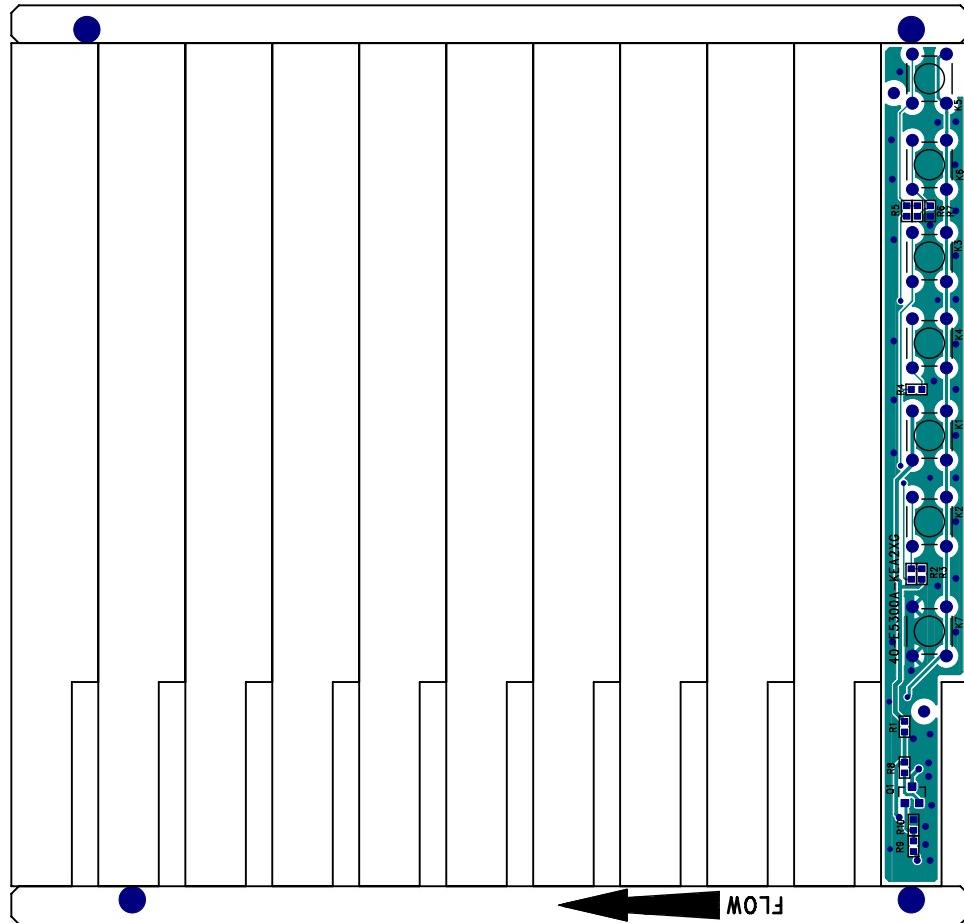
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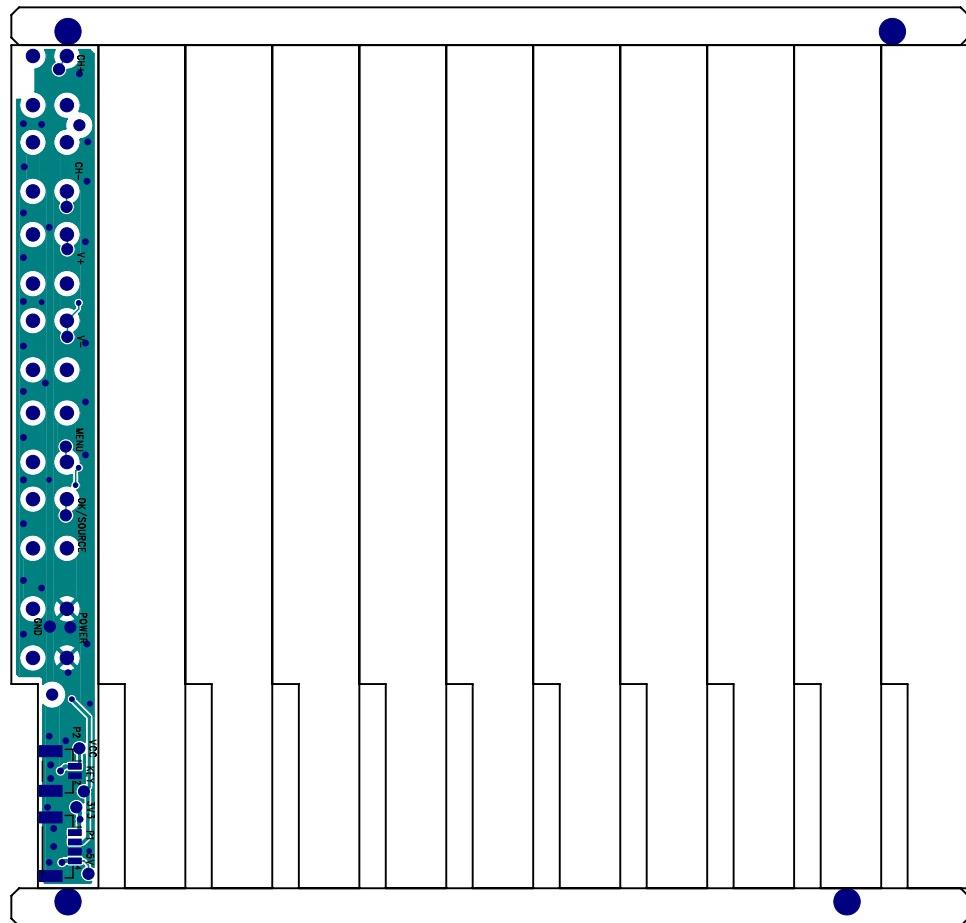
PCB Material	CCCP 508
Thickness(MM)	1.6MM
Layer	SINGLE SIDE
Copper Thickness	10Z
Surface treatment	OSP
Solder slot(C-PAD)	
Other	



Attachment 9

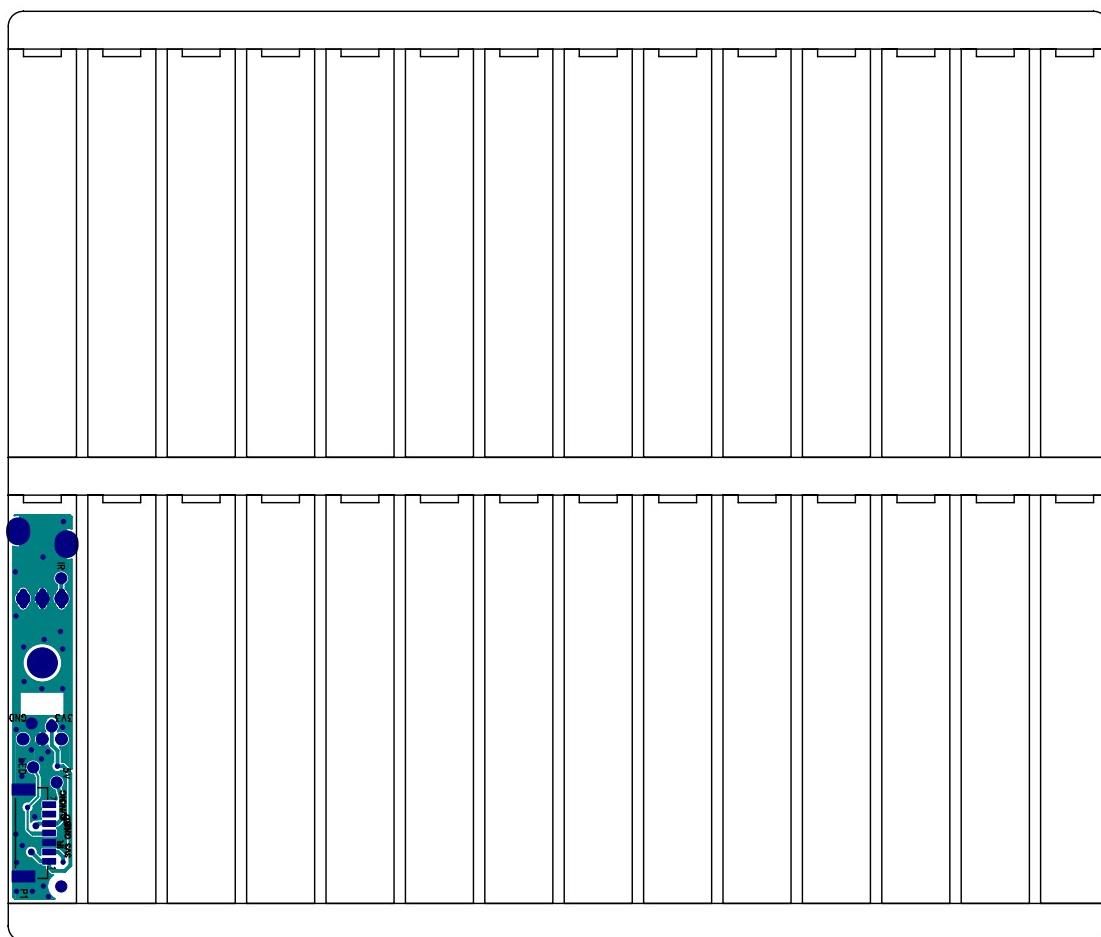


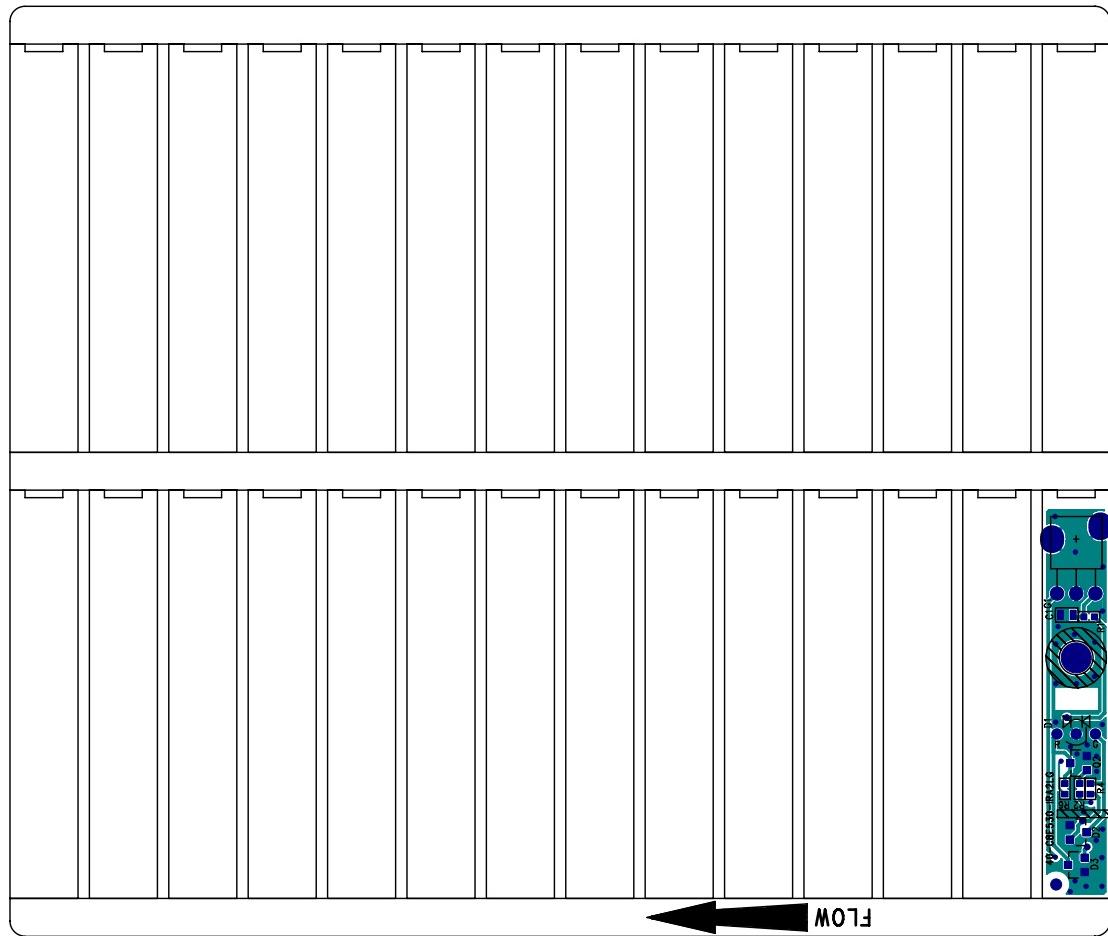
PCB Material	FR-4
Thickness(MM)	1.6MM
Layer	DOUBLESIDE
Copper Thickness	10Z
Surface treatment	OSP
Solder slot(C-PAD)	
Other	



Outlet
Solar cell interface
Cable tie holes
Double side
Layer
MMAj.
Litholess(W)
FR-4
PCB Material

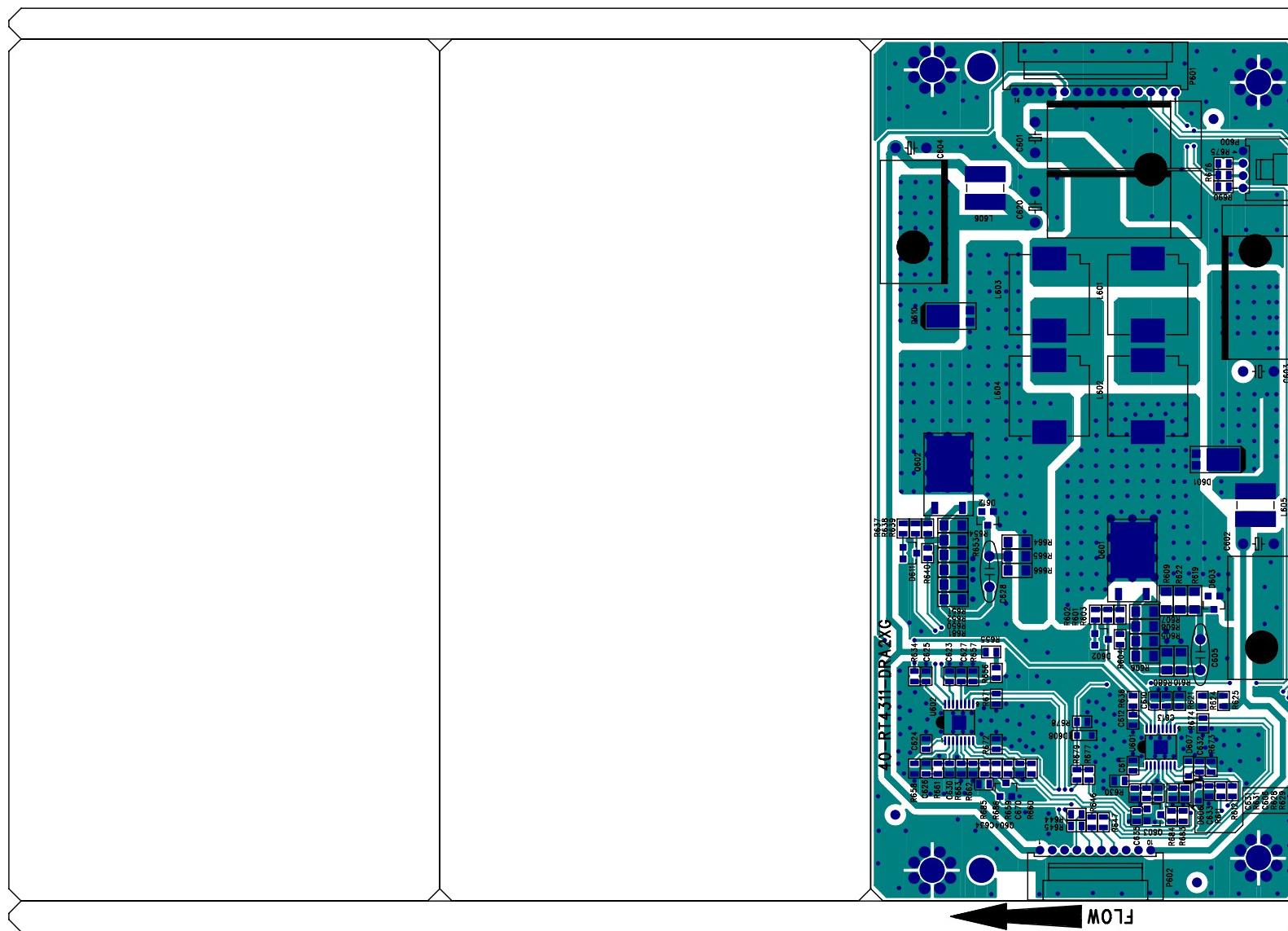
Attachment 10





PCB Material	FR-4
Thickness(MM)	1.6MM
Layer	DOUBLESIDE
Copper Thickness	10Z
Surface treatment	OSP
Solder slot(C-PAD)	
Other	

Attachment 11



PCB Material	FR-4
Thickness(MM)	1.6MM
Layer	DOUBLESIDE
Copper Thickness	10Z
Surface treatment	OSP
Solder slot(C-PAD)	
Other	

